



COUNTY OF HUMBOLDT
PLANNING AND BUILDING DEPARTMENT
CURRENT PLANNING DIVISION

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Phone: (707)445-7541 Fax: (707) 268-3792

Hearing Date: June 1, 2017

To: Humboldt County Planning Commission

From: John H. Ford, Director of Planning and Building Department

Subject: **Northcoast Regional Land Trust Conditional Use Permit**
Case Number CUP-16-145
Application Number 11085
Assessor Parcel Numbers Assessor Parcel Numbers 301-221-001, -006, -007, 302-161-003, 305-021-010, 305-021-011, 301-031-008, -013-, -018, and 305-031-001
Eureka Area

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Please contact Michelle Nielsen, Senior Planner, at 707-268-3708 or by email at mnienlsen@co.humboldt.ca.us if you have any questions about the scheduled public hearing item.

cc: California Coastal Commission, Kate Huckelbridge

AGENDA ITEM TRANSMITTAL

Hearing Date	Subject	Contact
June 1, 2017	Conditional Use Permit	Michelle Nielsen

Project: A Conditional Use Permit for the Martin Slough Enhancement Project (MSEP), an estuary enhancement project. Work will occur in both the unincorporated area and inside the City of Eureka in up to six or more phases depending on available funding. Phase 1, the tide gate replacement, occurred in 2014. The applicant's Project Description dated June 2016 provides phasing details. The project involves excavation of approximately 3,050 feet of the main channel of Martin Slough and approximately 1,300 feet of an old meander channel to remove accumulated sediment, and increase floodwater and tide water conveyance through the project area; excavation of a stream channel to daylight and reconnect a section of a tributary creek; construction and enlargement of tidal and freshwater wetlands to increase floodwater storage and provide enhanced fisheries and waterfowl habitat. All phases include placement of large wooden structures to enhance habitat, installation and removal of fish exclusion screens, fish capture and relocation, installation and removal of coffer dams, installation of stream bypass equipment, improvements to existing drainage infrastructure, installation of erosion control measures, and revegetation. Excavation will result in a total of approximately 65,000 cubic yards of sediment, of which approximately 55,000 cubic yards will be hauled offsite to White Slough in the Humboldt Bay National Wildlife Refuge or another approved location. The remaining approximately 10,000 cubic yards of excavated sediment is to be used in the project area to fill low spots in pasturelands and in the City of Eureka Municipal golf course to create positive drainage to prevent ponding on the floodplain and fish stranding during flood events. Approximately 125 cubic yards of the excavated sediment will be placed on the berm that separates Martin Slough and Swain Slough to fill low spots. The project also involves installation of gas line scour protection; relocation of 130 feet of 6-inch natural gas line; and decommissioning and abandoning a 4-inch natural gas line; and the installation of cattle exclusion fencing on NRLT property. Temporary project activities include the hauling and stockpiling of spoils resulting from excavation, construction of temporary haul roads, including bridges. APN 305-031-001, the Shanahan Property, will be used as a staging area for PG&E to decommission and move the location of their gas lines. All of the properties located in the County's jurisdiction are in the Coastal Zone. The Coastal Development Permit has been consolidated, and is being processed by the California Coastal Commission. The Conditional Use Permit application only applies to lands and activities located and occurring in the County.

Project Location: The project is located in Humboldt County, in the Eureka area, on the east side of Elk River Road, the south side of Pine Hill Road and the east side of Myers Avenue, approximately 350 feet south from the intersection of Elk River Road and Pine Hill Road and approximately 0.35 mile east from the intersection of Elk River Road and Pine Hill Road, on the property known as 5431 Elk River Road, 5700 and 6111 Meyers Avenue and the property know to be in Sections 3, 4 and 9 of Township 04 North, Range 01 West, HBM.

Present Plan Designation: Agriculture Exclusive/Prime and Non-prime Lands (AE), Density: 160 to 20 acres per dwelling unit; Humboldt Bay Area Plan (HBAP); Slope Stability: Relatively Stable (0) and Moderate Instability (2).

Present Zoning: Agriculture Exclusive - Minimum lot size 60 acres/Flood Hazard Areas, Transitional Agricultural Lands (AE-60/F,T); Natural Resources/Coastal Wetlands (NR/W).

Case Number: CUP-16-145

Application Number: 11085

Assessor Parcel Numbers: 301-221-001, -006, -007, 302-161-003, 305-021-010, 305-021-011, 301-031-008, -013-, -018, and 305-031-001.

Applicant

Northcoast Regional Land Trust
Attn: Michael Cipra
PO Box 398
Bayside, CA 95524

Owner

Northcoast Regional Land Trust
PO Box 398
Bayside, CA

Agent

Redwood Community Action Agency
Attn: Elijah Portugal
904 G Street
Eureka, CA 95501

Additional Owners:

Vroman Trueman
2950 E St Ste C
Eureka, CA 95501

Greg Shanahan
PO Box 6514
Eureka, CA 95502

City of Eureka
Attn: Miles Slattery
531 K Street
Eureka, CA 95501

Environmental Review: Environmental review is required.

Major Issues: None

State Appeals Status: Project is not appealable to the California Coastal Commission

Northcoast Regional Land Trust

Case Number: CUP-16-145

Assessor Parcel Numbers: 301-221-001, -006, -007, 302-161-003, 305-021-010,
305-021-011, 301-031-008, -013-, -018, and 305-031-001

Recommended Planning Commission Action

1. Describe the application as part of the Consent Agenda.
2. Survey the audience for any person who would like to discuss the application.
3. If no one requests discussion, make the following motion to approve the application as a part of the consent agenda:

Adopt the Mitigated Negative Declaration, and to make all of the required findings for approval of the Conditional Use Permit based on evidence in the staff report and any public testimony, and adopt the Resolution approving the proposed Northcoast Regional Land Trust project subject to the recommended conditions.

Executive Summary:

A Conditional Use Permit is being requested by the Northcoast Regional Land Trust (NRLT) for an estuary enhancement project that involves development in the main channel of Martin Slough and its tributaries. The project area spans both the unincorporated and incorporated areas beginning at the confluence of Martin Slough with Swain Slough extending into Martin Slough's upper tributaries located in the City of Eureka's municipal golf course. Martin Slough is the last (most downstream) tributary to Elk River via Swain Slough. The mouth of Martin Slough is separated from Swain Slough by a berm and tide gates. The project area involves lands owned by the City of Eureka, Northcoast Regional Land Trust, and other lands held by two other private landowners. The project activities meet the definition of Fish and Wildlife Habitat Management as defined in Humboldt County Code Section 313-176.2:

Fish and Wildlife Habitat Management. The Fish and Wildlife Habitat Management Use Type refers to the manipulation or maintenance of vegetation or streams, or construction of minor structures to yield desired results in terms of habitat suitable for designated wildlife or fishery species or groups of species. (Former Section CZ#A313-12(B))

These activities and associated development are principally permitted in the Natural Resources zoning district while in the Agricultural Exclusive zone a Conditional Use Permit (CUP) is required and has been applied for. The applicant has also secured the consent of the others property owners that in the project area. All activities and improvements constitute development and are permissible only with an approved Coastal Development Permit (CDP). A portion of the project area is located within the California Coastal Commission's retained Coastal Permit jurisdiction, namely the Martin Slough channel and adjoining areas. Because the dual CDP jurisdiction the applicant requested that the County's CDP be consolidated pursuant to Board of Supervisors Resolution No. 07-24 which authorizes the Planning and Building Department Director to recommend consolidation of CDP applications which span both the County and State's permit jurisdiction which is provided by Section 30601.3 of the Coastal Act. By way of letter, dated January 4, 2017, the Planning Director recommended to the Coastal Commission that the CDP be consolidated. Therefore, the County's only action is on the CUP.

The project goals are to improve aquatic and riparian habitat and reduce flooding throughout the project area. Specific goals of the project include the following:

1. Improve fish access from Swain Slough,
2. Increase the amount of riparian corridor and riparian canopy,
3. Reduce flood impacts to current land use,
4. Improve sediment transport,
5. Improve water quality (decrease nutrient impacts, decrease sedimentation, salinity)
6. Improve and increase the diversity and amount of freshwater and saltwater wetland habitat.

7. Protect or relocate utilities to prevent negative project impacts where avoidance is not feasible.

As discuss below the project will be carried out over six or more phases, with phases 2 and 4 being entirely occurring in the unincorporated area, and some actions in phases 5 and 6 occurring in the unincorporated area. The proposed project includes multiple components that are all interrelated. These include a new tide gate structure (completed in 2014 and being a critical element to the functionality of the rest of the project), enlargement of the Martin Slough channel, relocation and decommissioning of buried natural gas lines, installation of scour protection over buried natural gas lines under channels or marsh plains, construction of several tidal ponds, raising of some local low areas on the golf course to elevation 7.0 feet (NAVD88), replacement of multiple agricultural-use and golf course stream crossings (including culverts in the pasture and bridges at the golf course), installation of large wood habitat structures throughout the project, and extensive planting of wetland and riparian vegetation. Hydraulic, hydrologic, and geomorphic analysis were used to develop the interrelated project components through an iterative design process. The total volume excavated and the disposition of the spoils from the expansion of the channel, ponds, and creation of new ponds is 65,000 cubic yards of which 55,000 cubic yards will be hauled off-site to White Slough in the Humboldt Bay National Wildlife Refuge or another approved location. The remaining 10,000 cubic yards (CYD) of material will be reused within the project area. The project will result in approximately 3,250 to 6,500 onsite and offsite truck trips, depending use of whether a 10 yard or 20 yard capacity truck is used for hauling. Phases 4 and 6 involve the largest amounts of excavation of material, approximately 30,202 CYD and 16,112 CYD, respectively of off-hauled materials.

Project Phasing

The project implementation will likely occur in up to 6 or more phases. Phase 1, the Tide Gate Replacement, occurred in 2014, and is complete. All subsequent phases include placement of large wood to enhance habitat, installation and removal of fish exclusion screens, fish capture and relocation, installation and removal of coffer dams, installation of stream bypass equipment (pumps and/or gravity flow pipes), installation of erosion control measures, and re-vegetation.

Phase 2 implementation will take 3 to 4 weeks and is proposed for the summer of 2017 and will occur in the unincorporated area. Phase 2 includes excavating the Martin Slough channel and adjacent Marsh Plain A from the tide gates (station 0+00) to station 9+50, and excavating the southeast tributary and pond. Phase 2 will also include gas line relocation (6-inch line) and decommissioning of the 4-inch line (collectively called the gas line project). The gas line project is described more fully in section 1.6.2 of the Project Description (Attachment 3). The gas line project is being designed by PG&E with the expectation that it will occur in 2017 and would therefore occur in conjunction with phase 2.

Phases 3 through 6 do not have funding yet so their timeline for implementation is uncertain, however, it is known that each phase will take one construction season (June 15 – October 15) with each construction season having a duration of 4 to 12 weeks. Phase 3 is on City of Eureka property and will include excavation of a new channel for the North Fork, filling in portions of the old channel, excavation of Pond G, and placing fill to eliminate depressions on the floodplain adjacent to the channel that currently pond up and present potential fish stranding opportunities. Phase 3 will create new freshwater-tidally-influenced habitat (Pond G) that California Department of Wildlife biologists have observed to provide ideal rearing conditions for juvenile coho salmon. These actions were recommended for Phase 3 by CDFW biologists because this area is considered to be "replacement" habitat for habitat that will become seasonally brackish habitat upon implementation of all phases and operation of the muted tide regulator and tidal prism at full design level. CDFW biologists have observed that juvenile coho have the highest abundance in winter months in tidally influenced reaches and off-channel ponds that have low levels of salinity (less than 5 parts per thousand – pers. comm. Michael Wallace). Currently Pond E, also known as the 17th hole irrigation pond, provides this type of habitat and CDFW fish sampling has revealed that the juvenile coho from that pond have the highest growth rates of any of their sampling sites around Humboldt Bay. Therefore the North Fork and Pond G enhancements have been proposed as Phase 3 so the use of the habitat by juvenile coho can be verified and observed before Pond E becomes seasonally brackish marsh. However, even under operation of the design muted tide, Pond E will likely exhibit low salinity due to increased freshwater input from seasonal rains and groundwater inflow during the main

time of the year when juvenile coho have been documented using Martin Slough (December to June). During the summer months some coho juveniles do reside in Martin Slough and it is expected that freshwater habitat in Ponds D, E, and F will be maintained in the upper layers as the water stratifies, as has been observed during fish sampling and water quality monitoring conducted between 2006 and 2016. Stratification causes a layering effect with the brackish being heavier and occupying the bottom of the pond and fresh water being lighter and occupying the upper part of the water column. Pond E will provide low-salinity habitat during most of this period, even at full design operation of the MTR. Pond F is further upstream and it will have very low salinity or be primarily fresh water during the rainy season, with increasing salinity during low flow times of the year but maintaining some freshwater habitat due to stratification. Pond G is expected to remain fresh throughout the year.

Phase 4 implementation will occur on Northcoast Regional Land Trust (NRLT) property, which is located in the unincorporated area and will include excavation of the Martin Slough channel from station 9+50 to 30+50, Marsh Plain B and meander stations M 0+00 to M 20+46; replacement of the culverts at meander station M 0+45 and M 20+10; and excavation of Pond C. An existing 5-foot-diameter by 40-foot-long culvert at station MS 13+65 to MS 14+05 will be replaced with a bridge. The old culvert will be removed and disposed at a metal recycling facility. Sheet piles will be installed on both banks from approximately station M 13+25 to M 14+35 at depths ranging from 20 to 32 feet (as per Sheet C-110, S-501, and S-502). Bridge footings will be installed, bridge beams will be installed, and decking and railing will be installed on the bridge. Phase 4 includes installation of large wood habitat structures, grade control weirs, riparian fencing, and re-vegetation. Phase 4 will include installation of scour protection on the 12-inch gas line that crosses the meander at Station M 8+00 and at Station M 18+75.

Phase 5 implementation will include excavating the Martin Slough channel on City of Eureka property from station 30+50 to 46+00, Pond D and the east fork excavation, and Pond E. Phase 5 also includes the installation of scour protection over a 12-inch gas line crossing on the east fork, installation of large wood habitat structures, installation of 6 new bridges and their associated footings, removal and disposal of 6 old bridges, installation of grade control weirs, and re-vegetation.

Phase 6 will include excavating the Martin Slough channel on City property from station 46+00 to 62+80, excavation of Pond F, installation of 4 new bridges, removal and disposal of 8 old bridges, installation of grade control weirs, installation of large wood habitat structures, hauling and disposing of spoils, placement and grading of spoils to fill depressions in the adjacent floodplain that "pond" water during heavy rain events and present potential fish stranding and mortality threats, and re-vegetation.

Although the project involves development within the City of Eureka, in the fall of 2016 it was determined the County would be the CEQA lead agency as the funding to implement Phase 2 was secured and would be implemented first, while phases 3 through 6 did not have funding in place at that time. Further, while the project components are interrelated they are also designed to stand on their own. Nonetheless, the prepared and circulated Initial Study and Mitigated Negative Declaration is for all Phases of the project.

All responding referral agencies have recommended approval or conditional approval of the project. Project approval is conditioned upon meeting their requirements. The Department has prepared and circulated a draft Mitigated Negative Declaration (MND) and has determined that the project, as proposed, mitigated and conditioned, will not have a significant effect on the environment.

Based on the on-site inspection, a review of Planning Division reference sources and comments from all involved referral agencies, planning staff believes that the applicant has submitted evidence in support of making all of the required findings for approving the Conditional Use Permit and Special Permit.

ALTERNATIVES: The Planning Commission could elect not to approve the project, or to require the applicant to submit further evidence, or modify the project. These alternatives could be implemented if your Commission is unable to make all of the required findings. Planning Division staff has stated that the required findings in support of the proposal have been made. Consequently, Planning staff does not recommend further consideration of either alternative.

**RESOLUTION OF THE PLANNING COMMISSION
OF THE COUNTY OF HUMBOLDT
Resolution Number 17-**

Case Number CUP 16-145

**Assessor Parcel Numbers: 301-221-001, -006, -007, 302-161-003, 305-021-010,
305-021-011, 301-031-008, -013-, -018, and 305-031-001**

Makes the required findings for certifying compliance with the California Environmental Quality Act and conditionally approves the Northcoast Regional Land Trust Conditional Use Permit.

WHEREAS, Northcoast Regional Land Trust submitted an application and evidence in support of approving a Conditional Use Permit for an estuary enhancement project to improve aquatic and riparian habitat and reduce flooding throughout the project area; and

WHEREAS, the County Planning Division has reviewed the submitted application and evidence and has referred the application and evidence to involved reviewing agencies for site inspections, comments and recommendations; and

WHEREAS, the project is subject to environmental review pursuant to the California Environmental Quality Act (CEQA); and

WHEREAS, Attachment 2 in the Planning Division staff report includes evidence in support of making all of the required findings for approving the proposed Conditional Use Permit (Case Number CUP 16-145); and

WHEREAS, a public hearing was held on the matter before the Humboldt County Planning Commission on June 1, 2017.

NOW, THEREFORE, be it resolved, determined, and ordered by the Planning Commission that:

1. The Planning Commission has considered the Initial Study and Mitigated Negative Declaration and the Mitigation and Monitoring Report in Attachment 5, and finds that there is no substantial evidence that the proposed project will have a significant effect on the environment, and that the Mitigated Negative Declaration reflects the County's independent judgement and analysis; and
2. The Planning Commission adopts the Initial Study and Mitigated Negative Declaration in Attachment 4 and the Mitigation Monitoring Report in Attachment 5, as required by Sections 15074(b) and 15074(d) of the CEQA Guidelines; and
3. The Planning Commission further makes the findings in Attachment 2 of the Planning Division staff report for Case Number CUP 16-145 based on the submitted evidence; and
4. The Planning Commission approves the Conditional Use Permit applied for as recommended and conditioned in Attachment 1 for Case Number CUP 16-145.

Adopted after review and consideration of all the evidence on June 1, 2017.

The motion was made by Commissioner ____ and seconded by Commissioner ____.

AYES: Commissioners:

NOES: Commissioners:

ABSTAIN: Commissioners:

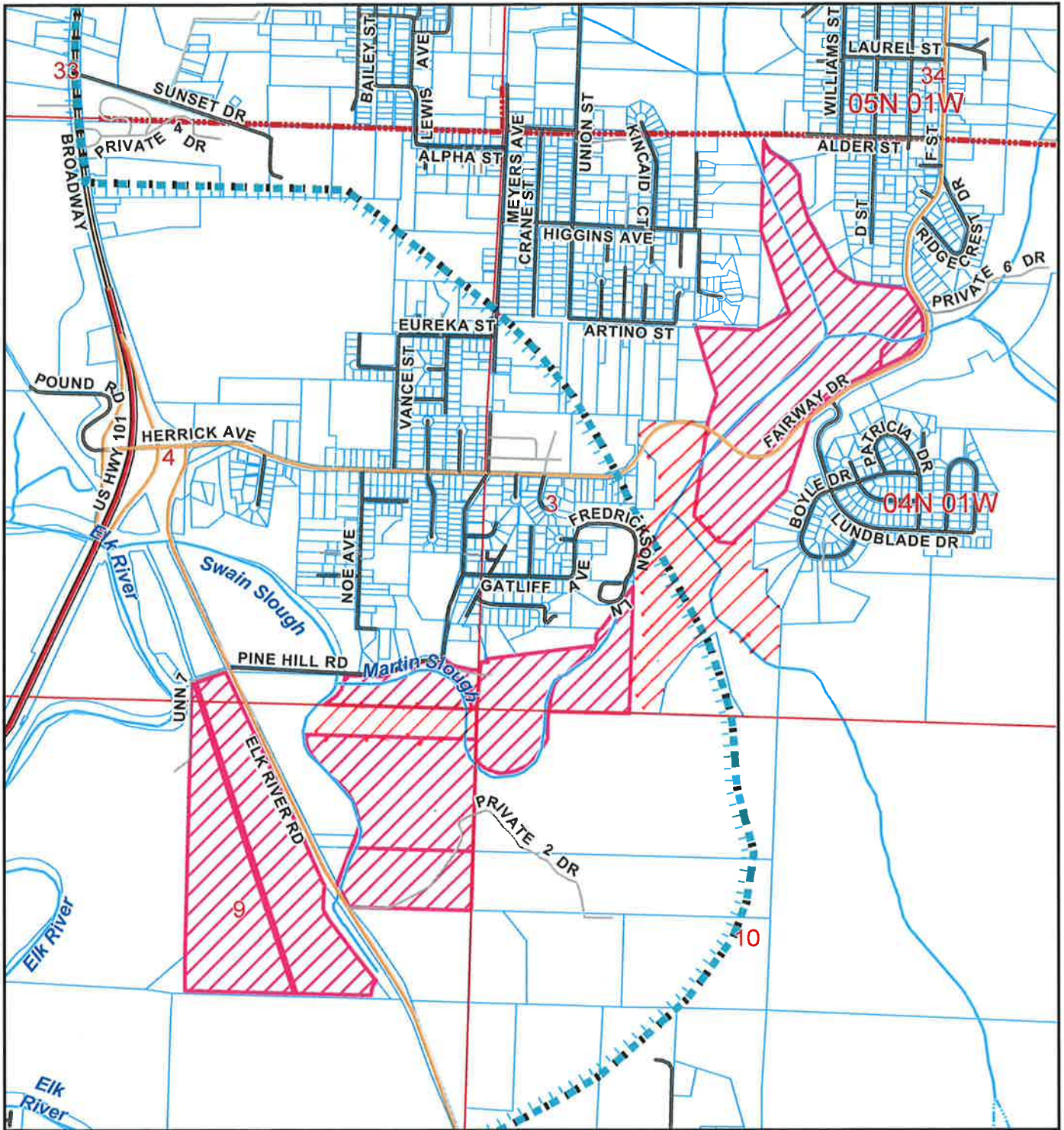
ABSENT: Commissioners:

DECISION: Motion carries

Robert Morris, Chair

I, Suzanne Lippre, Clerk to the Planning Commission of the County of Humboldt, do hereby certify the foregoing to be a true and correct record of the action taken on the above entitled matter by said Commission at a meeting held on the date noted above.

Suzanne Lippre, Clerk



LOCATION MAP

**PROPOSED NORTHCOST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA**

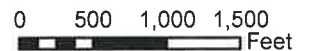
CUP-16-145

**APN: 301-221-001 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)**

Coastal Zone Boundary - - - - -

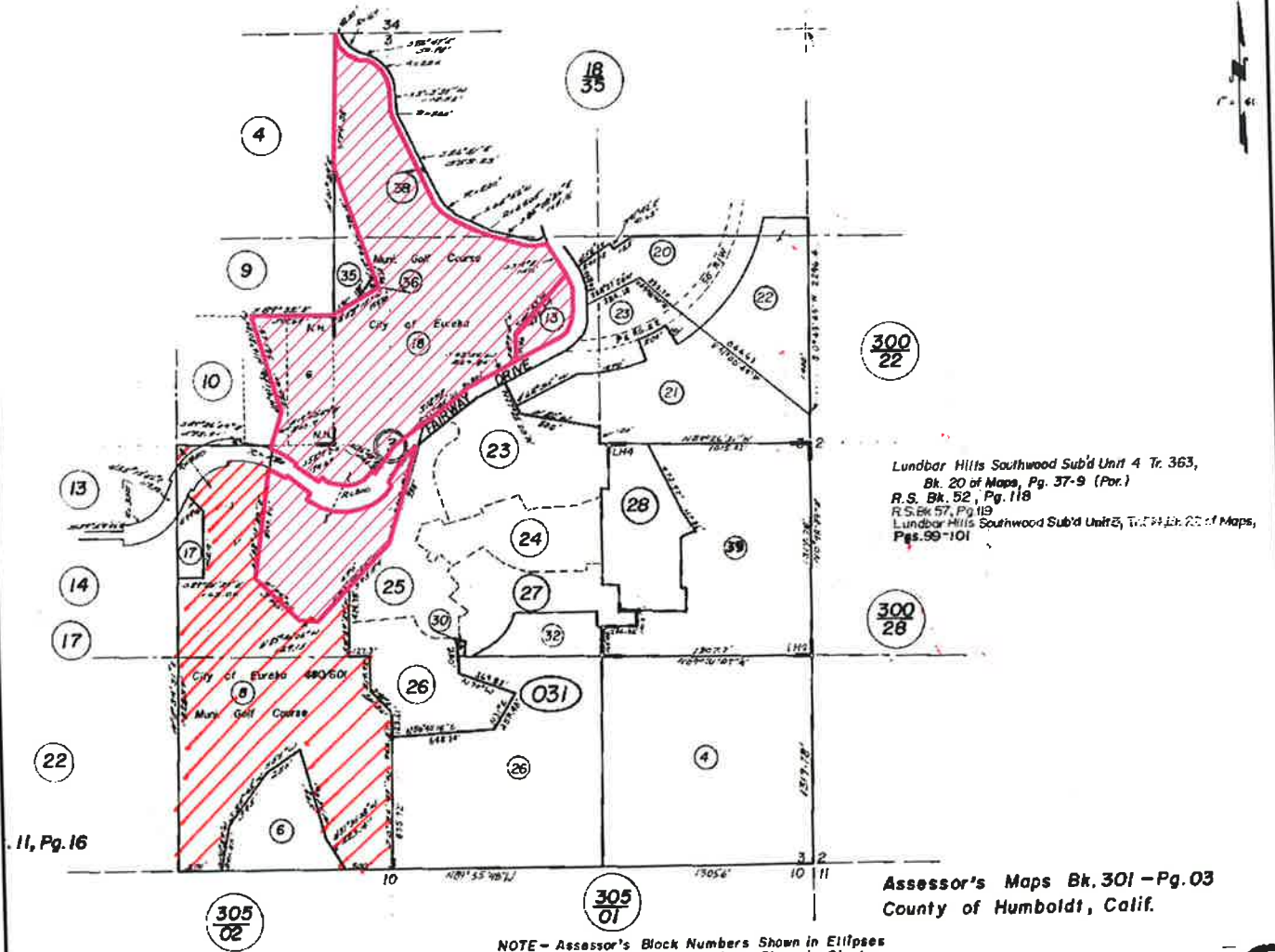
Project Area = 

This map is intended for display purposes and should not be used for precise measurement or navigation. Data has not been completely checked for accuracy.



POR. OF SEC. 3, T4N, R1W, H.B.&M.

301-03



ASSESSOR PARCEL MAP
PROPOSED NORTHCOAST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA
CUP-16-145

Project Area = 

APN: 301-221-001 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)

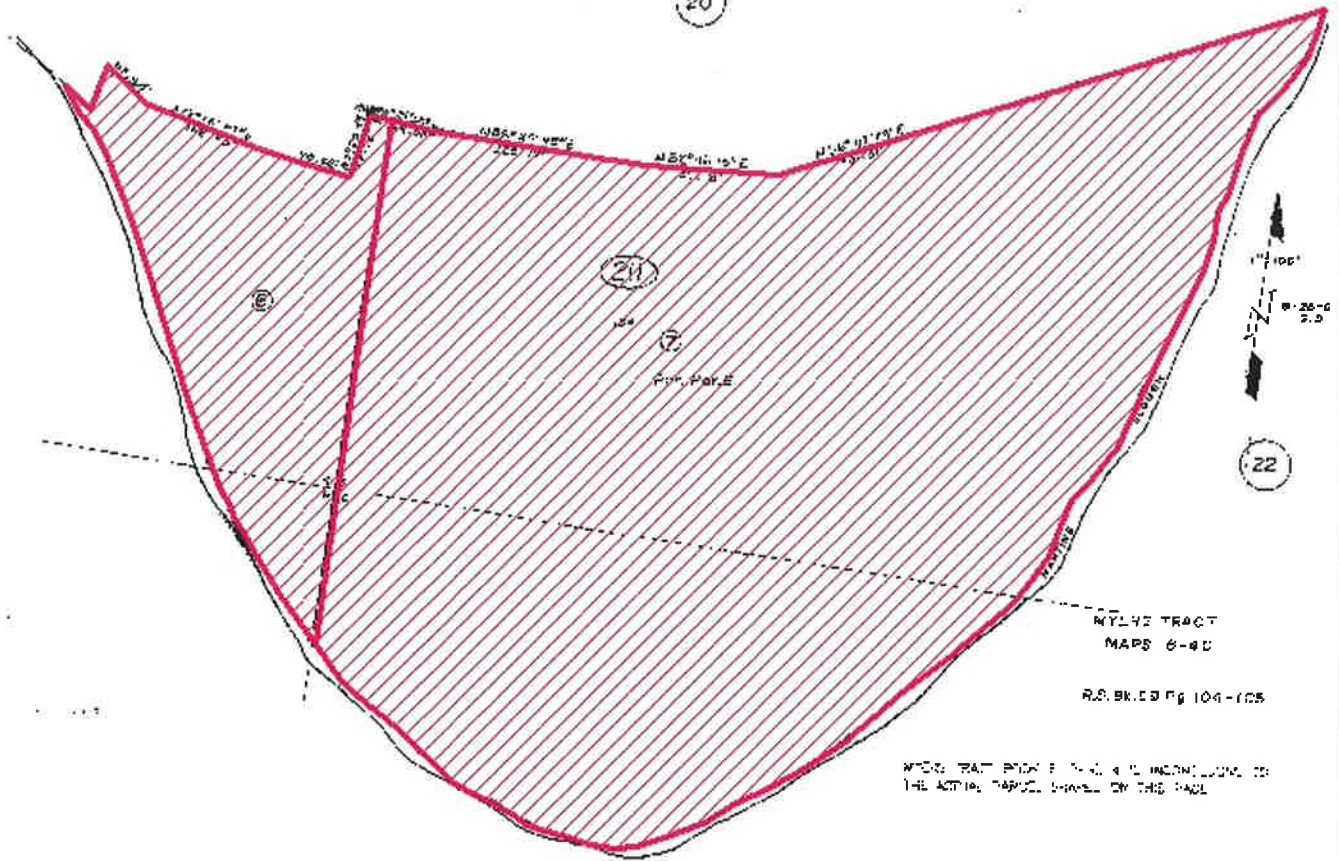
MAP NOT TO SCALE

This map is intended for display purposes and should not be used for precise measurement or navigation. Data has not been completely checked for accuracy.

PTN S.W. 1/4 SEC. 3 & S.E. 1/4 SEC. 4 T4N, 1W

301-21

(20)



ASSESSOR PARCEL MAP

**PROPOSED NORTHCOAST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA
CUP-16-145**

**APN: 301-201-017 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)**



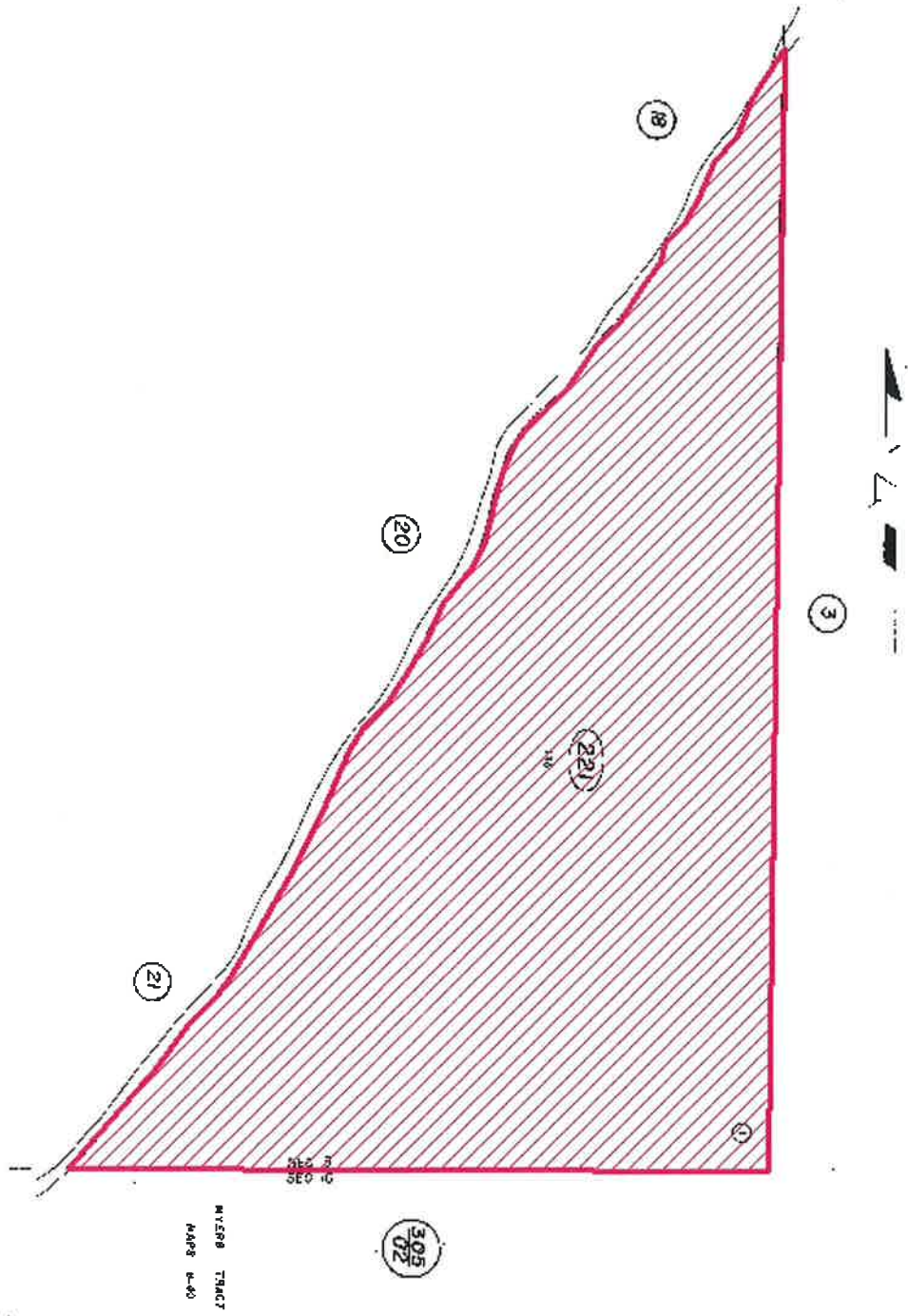
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Project Area = 

This map is intended for display purposes and should not be used for precise measurement or navigation. Data has not been completely checked for accuracy.

PTN S.W. 1/4 SEC. 3, T 4N, R 1W

301-22



ASSESSOR PARCEL MAP

**PROPOSED NORTHCOST REGIONAL LAND TRUST
 CONDITIONAL USE PERMIT
 EUREKA AREA
 CUP-16-145**

**APN: 301-201-017 et seq
 T04N R01W S3-4,9-10 HB&M
 (Eureka/ Fields Landing)**

Project Area = 

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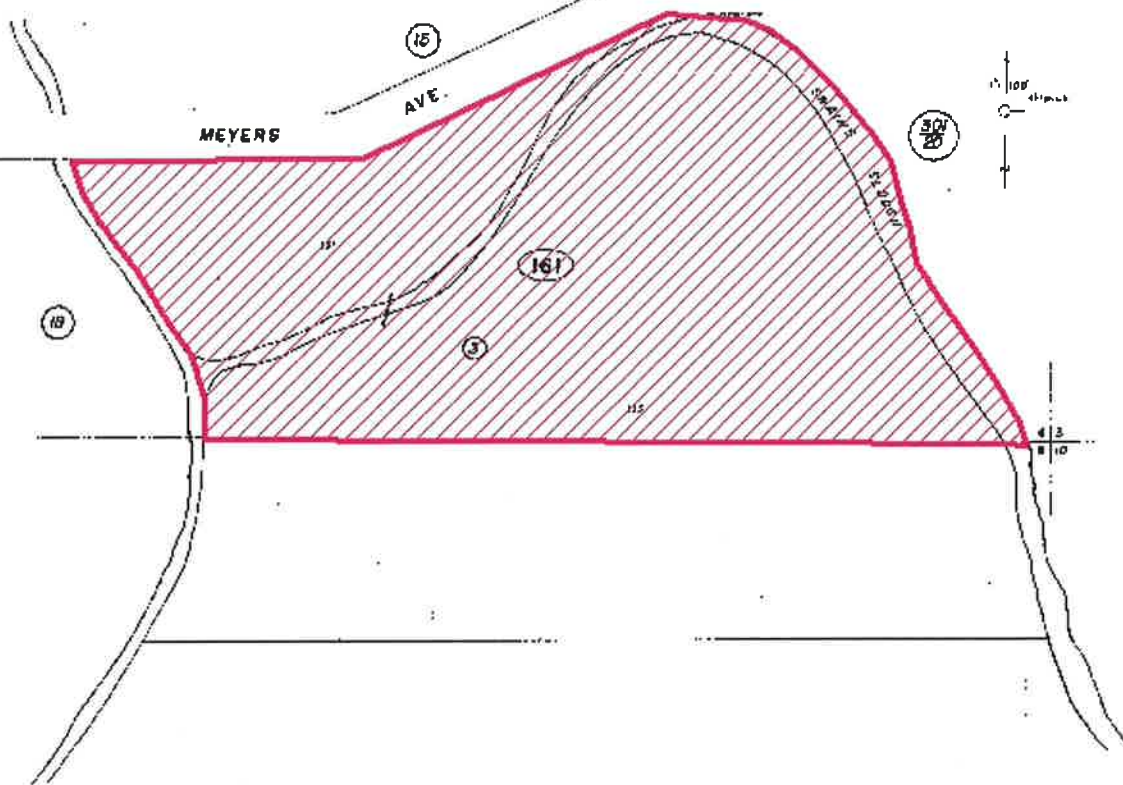


MAP NOT TO SCALE

PTN S.E. 1/4 SEC 4, T 4N, R 1W

308-16

MEYERS TR. MAPS 8-10



ASSESSOR PARCEL MAP

**PROPOSED NORTHCOAST REGIONAL LAND TRUST
 CONDITIONAL USE PERMIT
 EUREKA AREA
 CUP-16-145**

**APN: 301-201-017 et seq
 T04N R01W S3-4,9-10 HB&M
 (Eureka/ Fields Landing)**

Project Area = 

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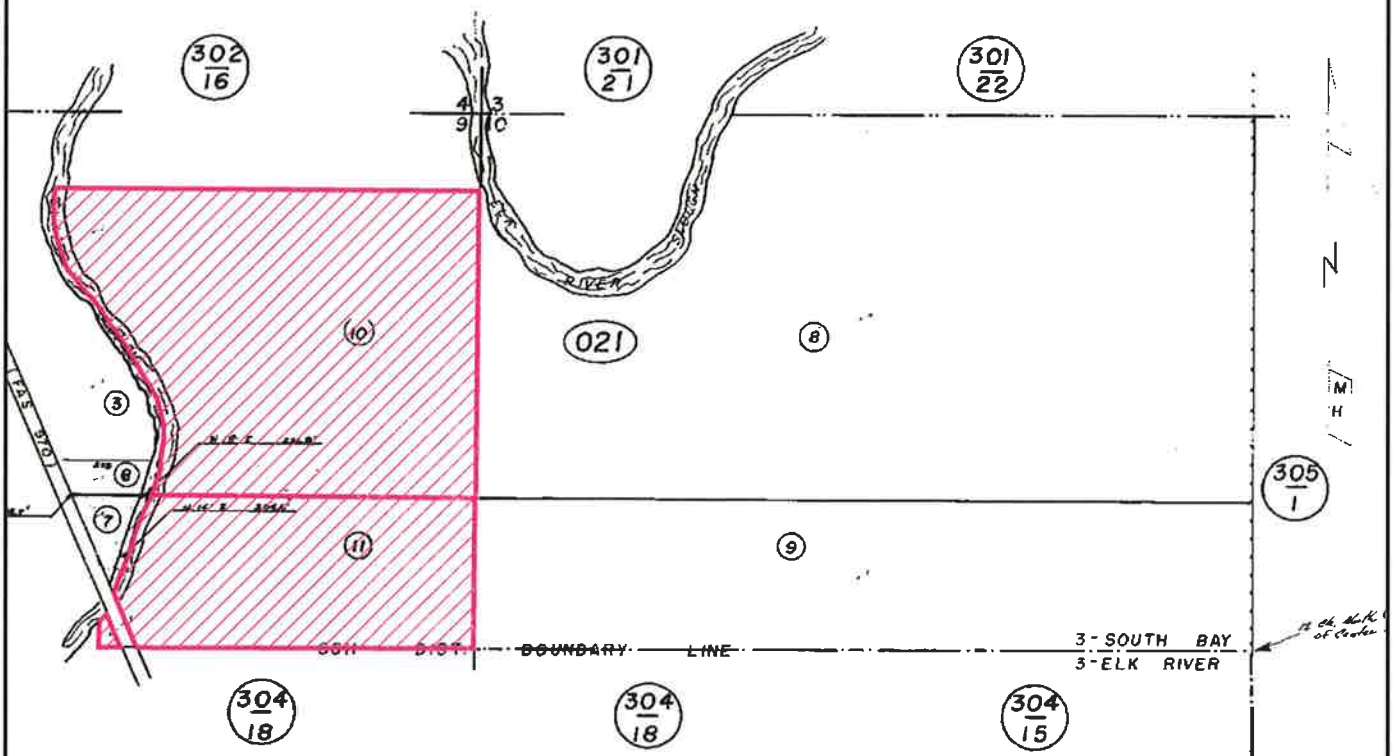
MAP NOT TO SCALE

PTN SECS 9 & 10, 4N 1W

305-02

1" = 400'

AERIAL PHOTO - CDF2-14-117



ASSESSOR PARCEL MAP

PROPOSED NORTHCOAST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA
CUP-16-145

APN: 301-221-001 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)

Project Area = 

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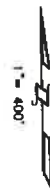


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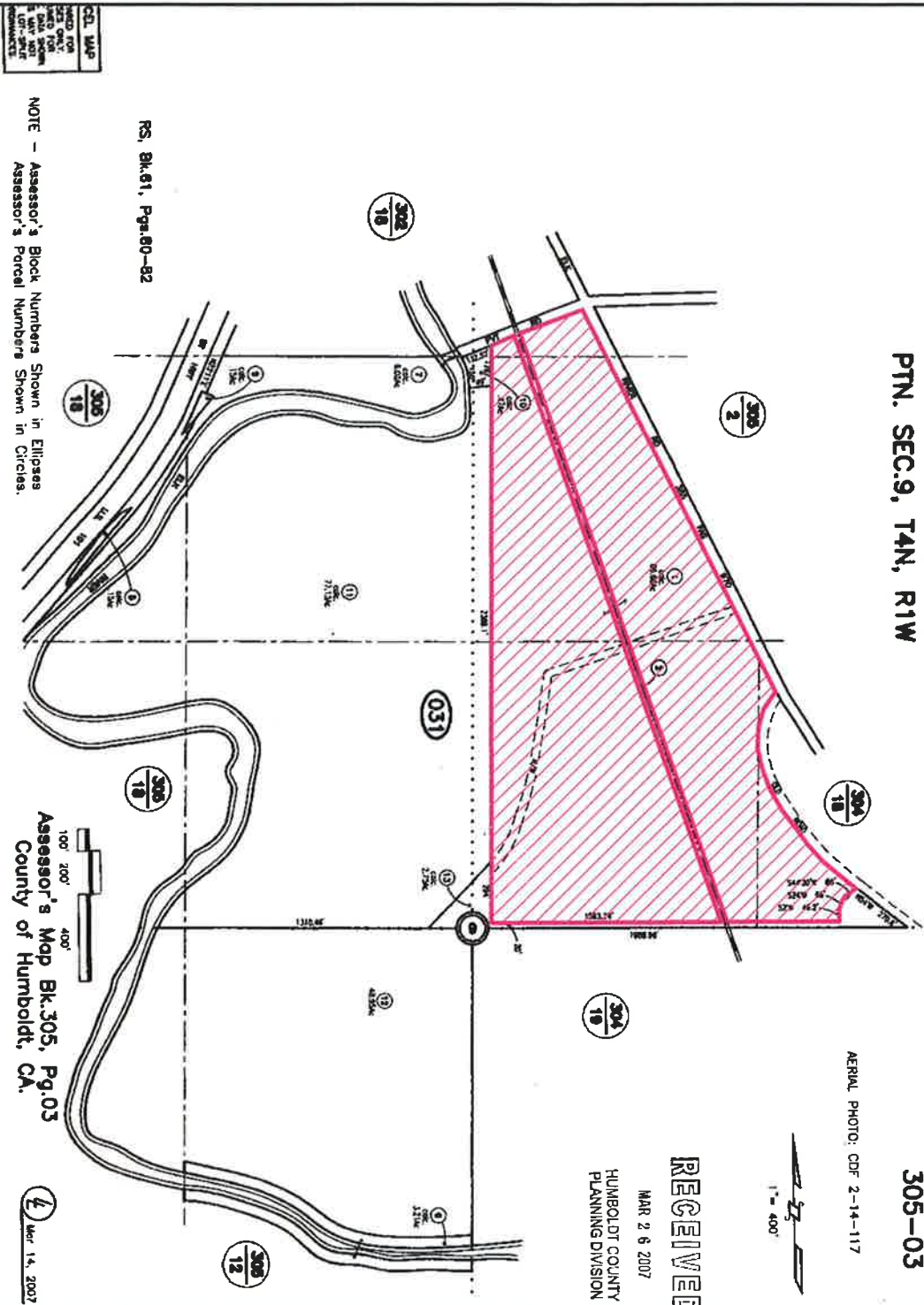
PTN. SEC.9, T4N, R1W

305-03

AERIAL PHOTO: CDF 2-14-117



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PLANNING DIVISION



NOTE - Assessor's Block Numbers Shown in Ellipses
Assessor's Parcel Numbers Shown in Circles.

RS. Bk. 61, Pg. 80-82

Assessor's Map Bk. 305, Pg. 03
County of Humboldt, CA.

4 Mar 14, 2007

ASSESSOR PARCEL MAP

**PROPOSED NORTHCOAST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA
CUP-16-145**

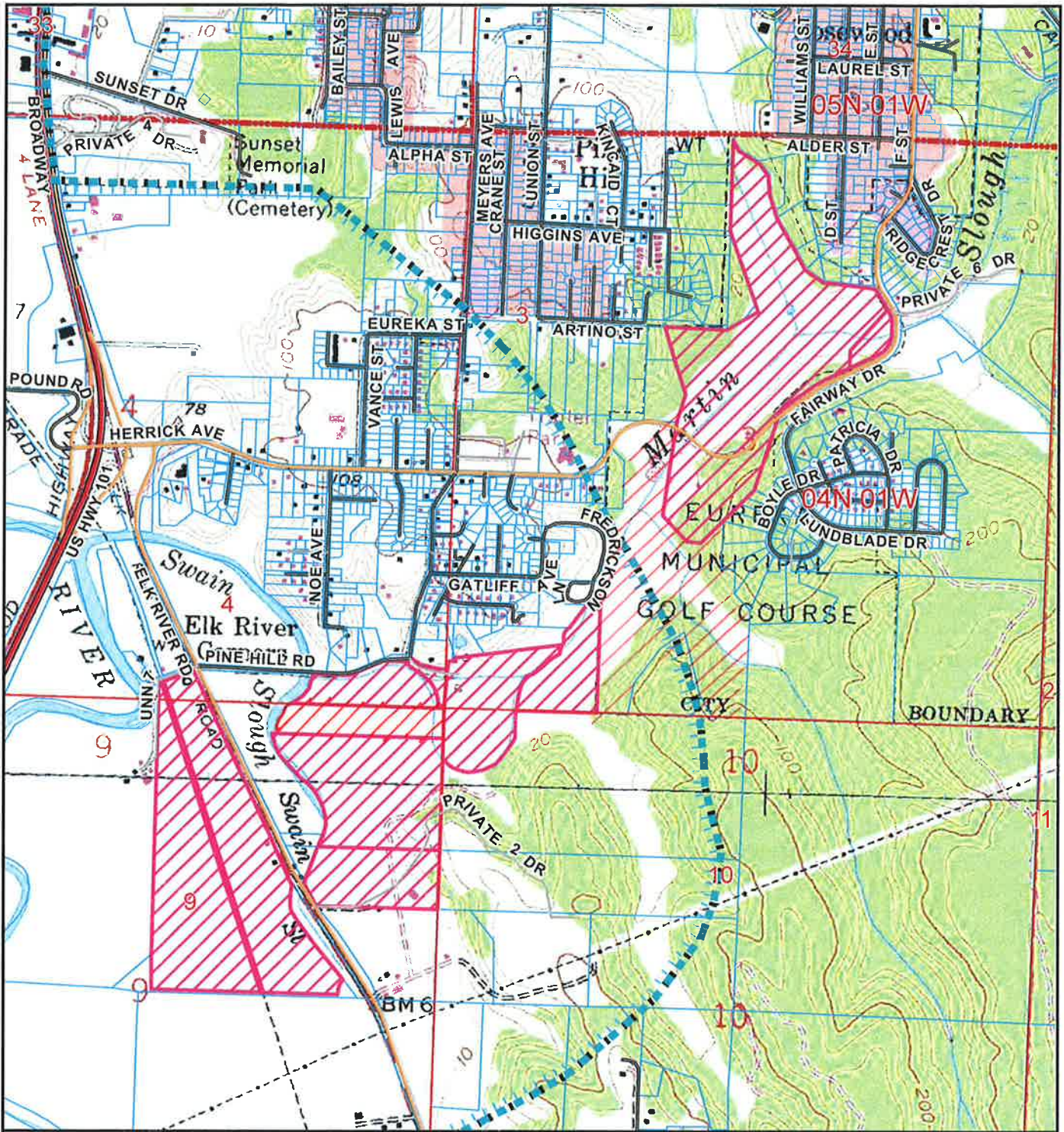
**APN: 301-221-001 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)**

Project Area = 

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MAP NOT TO SCALE



TOPO MAP

**PROPOSED NORTHCOST REGIONAL LAND TRUST
CONDITIONAL USE PERMIT
EUREKA AREA
CUP-16-145**


**APN: 301-221-001 et seq
T04N R01W S3-4,9-10 HB&M
(Eureka/ Fields Landing)**

Coastal Zone Boundary 

Project Area = 

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0 500 1,000 1,500
 Feet

Martin Slough Enhancement Project



Description of Phasing and Restoration Actions
Phase 1: Installed new tide gates to restore estuarine ecosystem function, increase conveyance and partially restore a muted tidal influence. **Completed 2014**

Phase 2: Construction and enlargement of tidal and freshwater wetlands to increase floodwater storage and provide enhanced fisheries and waterfowl habitat, and enlarge the channel to increase conveyance. Reach 1 and Marsh Plain A.

Phase 3: Creation of a freshwater alcove pond (Pond G) with deep open water and emergent wetland vegetation along banks, realign the NF Tributary to access the new pond and revegetate with natives.

Phase 4: Channel enhancement and wetland and riparian plantings (Reach 2) channel enhancement and creation of salt marsh plain (Marsh Plain B) 70 ft. wide along high flow meander bend. Creation of salt marsh adjacent to a freshwater spring and hydrologically connected to the mainstem (Pond C).

Phase 5: Channel enhancement (Reaches 3,4,5). Creation of one brackish pond with expanded wetlands, containing deep open water, littoral benches and elevated outlet sill that minimizes salinity intrusion (Pond E). Decommission and relocation of PG&E gas lines (location of gas lines not shown here).

Phase 6: Channel enhancement (Reaches 6 and 7). Creation of two topographically complex brackish ponds (Pond D and F) with expanded wetlands and riparian surrounding the ponds. Minor realignment of East Tributary feeding Pond D

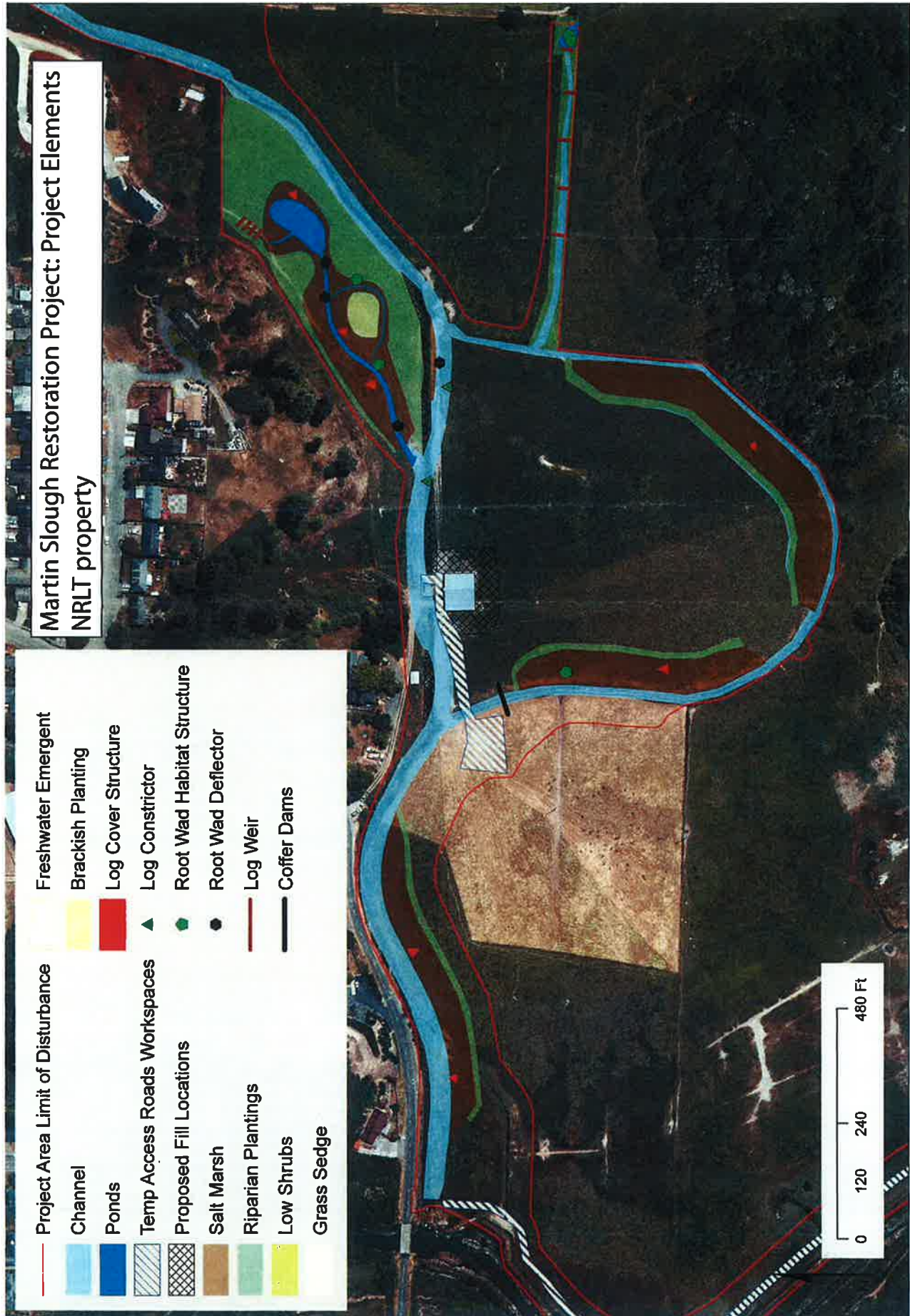
PROJECT ELEMENTS

- Marsh Planes A & B (0.75 acres & 2.3 acres) - salt marsh plain 50 ft wide paralleling slough channel and 70 ft wide along abandoned meander.
 - C (1.7 acres) - Salt marsh with low elevation pond connected to springs.
 - D & E (0.8 acres & 1.3 acres) - Expanded brackish wetlands, containing deep open water, littoral benches and elevated outlet sill that minimizes salinity intrusion during wet season.
 - F (1.7 acres) - Backwater slough with island and deep open water and littoral bench on inside of bend.
 - G (0.5 acres) - Predominantly freshwater alcove pond. Deep open water with emergent vegetation along banks.
 - North Fork Tributary (0.8 acres) - Restored channel with marsh plan and side channel.
 - South East Tributary (0.3 acres) - Restored channel with small freshwater pond connected to existing tributary.
- New channel dimensions** - Trapezoidal shape with 1.5:1 (H:V) side slopes and bottom elevation ranges from -1.0 to 2.8 ft. Stable tidal channel geometry based on published relationships of diurnal tidal prism and slough channel dimensions

Figure 2 Summary of Martin Slough Enhancement Project Components. Reach Number and Pond Name are Circled.

Martin Slough Restoration Project: Project Elements Large Scale



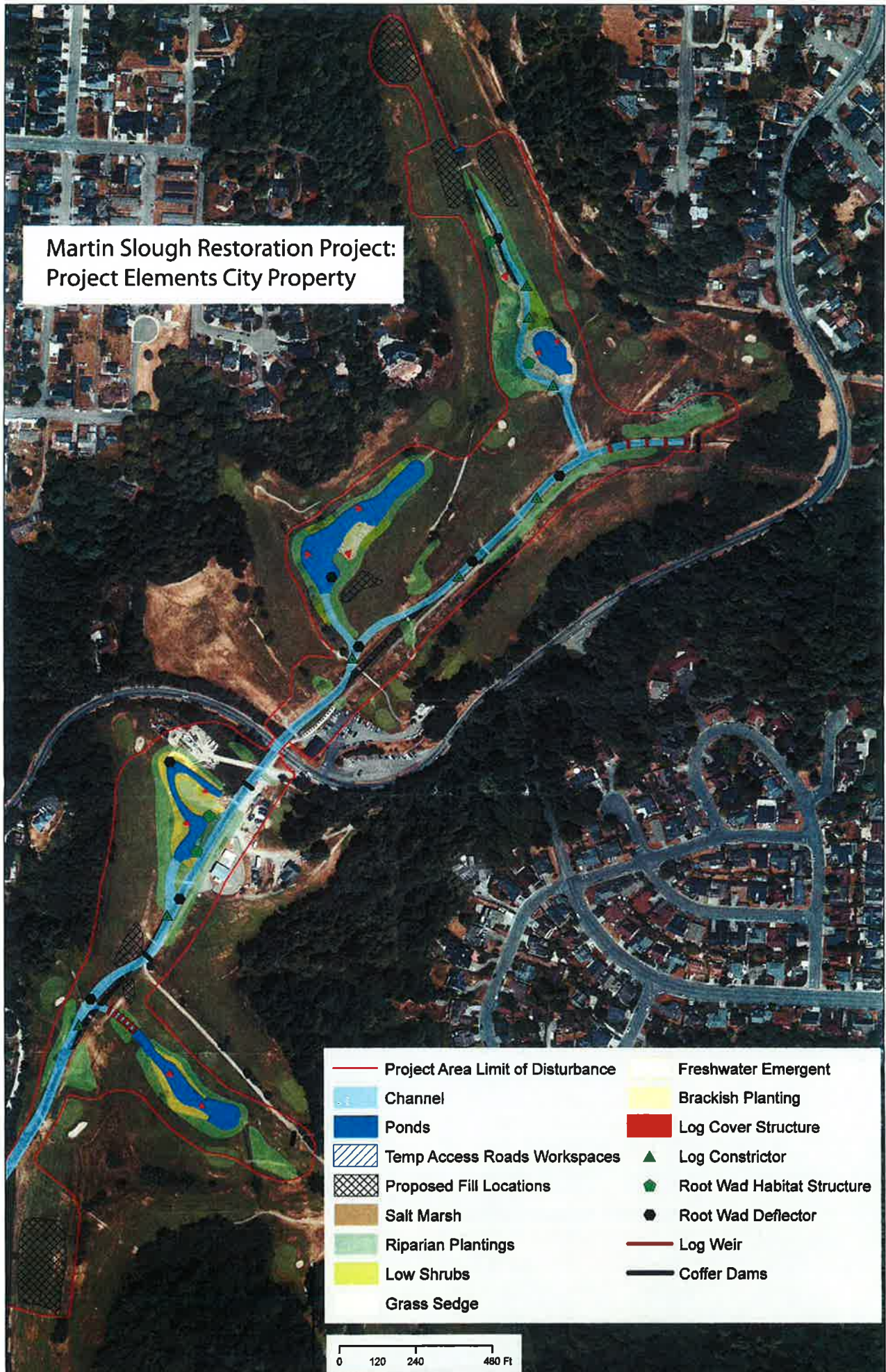


Martin Slough Restoration Project: Project Elements
 NRLT property

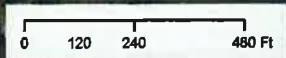
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|-----------------------------------|----------------------------|
| Project Area Limit of Disturbance | Freshwater Emergent |
| Channel | Brackish Planting |
| Ponds | Log Cover Structure |
| Temp Access Roads Workspaces | Log Constrictor |
| Proposed Fill Locations | Root Wad Habitat Structure |
| Salt Marsh | Root Wad Deflector |
| Riparian Plantings | Log Weir |
| Low Shrubs | Coffey Dams |
| Grass Sedge | |



**Martin Slough Restoration Project:
Project Elements City Property**



- Project Area Limit of Disturbance
- Channel
- Ponds
- Temp Access Roads Workspaces
- Proposed Fill Locations
- Salt Marsh
- Riparian Plantings
- Low Shrubs
- Grass Sedge
- Freshwater Emergent
- Brackish Planting
- Log Cover Structure
- Log Constrictor
- Root Wad Habitat Structure
- Root Wad Deflector
- Log Weir
- Coffer Dams



ATTACHMENT 1

RECOMMENDED CONDITIONS OF APPROVAL

Approval of the Conditional Use Permit is conditioned upon the following terms and requirements which must be fulfilled before a Building permit may be issued or use initiated.

1. The applicant shall be responsible for obtaining all necessary County, State, and Federal permits or licenses, and for meeting all of the requirements as set forth by other regulatory agencies.
2. The applicant shall obtain all necessary building permits and grading permits from the Building Inspection Division (BID) for all structures and grading. The applicant/owner shall submit plans by a California-licensed engineer for the building permit and grading permit. All building and grading plans submitted for approval shall be consistent with those approved by the Planning Commission.
3. The applicant shall obtain all necessary permits and approvals from the Department of Public Works pursuant to the Land Use Division memorandum dated October 21, 2016, Exhibit B of Attachment 1.
4. All mitigation measures identified in the Mitigated Negative Declaration shall be implemented consistent with the Mitigation Monitoring Plan. Copies of the Annual Monitoring Reports shall be provided to the Planning Division.
5. Prior to project implementation, the applicant is responsible for receiving a Coastal Development Permit through the California Coastal Commission.
6. **Prior to hearing**, the applicant shall submit a check to the Planning Division payable to the Humboldt County Recorder in the amount of \$2,266.25. Pursuant to Section 711.4 of the Fish and Game Code, the amount includes the \$2,216.25 Department of Fish and Wildlife (DFW) fee plus a \$50 document handling fee. This fee is effective through December 31, 2017, at such time the fee will be adjusted pursuant to Section 713 of the Fish and Game Code. Alternatively, the applicant may contact DF&W by phone at (916) 651-0603 or through the DF&W website at www.dfg.ca.gov for a determination stating the project will have *no effect* on fish and wildlife. If DF&W concurs, a form will be provided exempting the project from the \$2,216.25 fee payment requirement. In this instance, only a copy of the DFW form and the \$50.00 handling fee is required.
7. The applicant is required to pay for permit processing on a time and material basis as set forth in the schedule of fees and charges as adopted by ordinance of the Humboldt County Board of Supervisors. The Department will provide a bill to the applicant after the decision. Any and all outstanding Planning fees to cover the processing of the application to decision by the Hearing Officer shall be paid to the Humboldt County Planning Division, 3015 "H" Street, Eureka.

On-Going Conditions to be satisfied for the life of the project

1. The project shall be developed, operated and maintained in accordance with the project site plans, the Project Description dated June 2016, the adopted Initial Study and Mitigated Negative Declaration. Changes to the project except for Minor Deviations to the Plot Plan as provided in Section 312- 11.1, shall require Modification of this permit.

Informational Notes:

1. If buried archaeological or historical resources are encountered during construction activities, the contractor on-site shall call all work in the immediate area to halt temporarily, and a qualified archaeologist is to be contacted to evaluate the materials. Prehistoric materials may include obsidian or chert flakes, tools, locally darkened midden soils, groundstone artifacts, dietary bone, and human burials. If human burial is found during construction, state law requires that the County Coroner be contacted immediately. If the remains are found to be those of a Native American, the California

Native American Heritage Commission will then be contacted by the Coroner to determine appropriate treatment of the remains.

The applicant is ultimately responsible for ensuring compliance with this condition.

3. This permit shall expire and become null and void at the expiration of two (2) years after all appeal periods have lapsed; except where construction under a valid building permit or use in reliance on the permit has commenced prior to such anniversary date. The period within which the activity or use must be commenced may be extended as provided by Section 312-11.3 of the Humboldt County Code.



DEPARTMENT OF PUBLIC WORKS
COUNTY OF HUMBOLDT
MAILING ADDRESS: 1106 SECOND STREET, EUREKA, CA 95501-0579
AREA CODE 707

ARCATA-EUREKA AIRPORT TERMINAL
McKINLEYVILLE
FAX 639-3596

PUBLIC WORKS BUILDING
SECOND & L ST., EUREKA
FAX 445-7409

CLARK COMPLEX
HARRIS & H ST., EUREKA
FAX 445-7388

AVIATION 839-5401

ADMINISTRATION 445-7481
BUSINESS 445-7652
ENGINEERING 445-7377
FACILITY MAINTENANCE 445-7493

NATURAL RESOURCES 445-7741
NATURAL RESOURCES PLANNING 267-9540
PARKS 445-7651
ROADS & EQUIPMENT MAINTENANCE 445-7421

LAND USE 445-7205

LAND USE DIVISION MEMORANDUM

TO: Michelle Nielsen, Planner II, Planning & Building Department

VIA: Robert W. Bronkall, Deputy Director

FROM: Kenneth Freed, Senior Engineering Technician 

DATE: 10/21/2016

RE: **NORTHCOAST REGIONAL LAND TRUST, APN 301-201-017, CUP16-145**

This project is located between two paved County maintained roads known as Elk River Road (3J305) and Pine Hill Road (3J430).

Our review of this project is limited to what is shown on the submitted plot plan. If other facilities not shown on the plot plan will be constructed, contact this Department immediately for approval **before** construction. This Department has regulations regarding facilities such as retaining walls, fence site location and visibility, drainage culverts, and parking lanes within the County right of way. This Department has included general statements for facilities that may not be included on the plot plan.

The Department recommends the following:

1.0 ENCROACHMENT PERMIT

1.1 Applicant must apply for and obtain an encroachment permit for all permanent and temporary construction entrances from County maintained roads. Construction entrances shall be constructed per Section TC-1 of the California Stormwater BMP Handbook (November 2009).

All temporary construction entrances shall be removed and fences restored for final project signoff. In addition, the land shall be naturalized so that it does not appear that an access road was ever constructed at that location.

1.2 All permanent encroachments shall be paved a minimum of 25 feet back from the edge of the existing road pavement and be flared a minimum of 30 feet at the intersection with the County road. All temporary encroachments with an estimated ADT exceeding 8 may be required to be paved per the above standard. At the time the finalized plans are

submitted, the Department will review each permanent and temporary encroachment on an individual basis to determine construction entrance paving requirements.

- 1.3 During Phase 1 it appears that the project constructed a permanent entrance. The entrance is located at the recently constructed concrete flood gate structure. No Encroachment Permit was applied for at the time of this project. The Department will require that this permanent entrance be improved to County Standards.



Photo: Recently constructed concrete flood gate structure with gravel entrance.

- 1.4 Site visibility must be maintained at the construction entrances in conformance with County Code. All fence or gate structures (pillars) shall be a minimum of 25 feet back from the existing edge of pavement.
- 1.5 All fueling, equipment maintenance, staging, and construction management shall be located **outside** the County road right of way.
- 1.6 The County roads are not constructed to allow for parking; therefore, all construction and inspection vehicles shall be provided an area outside the County right of way. No construction materials (construction trailers, storage containers, equipment, materials, etc.) or staging activities shall be allowed within County right of way.
- 1.7 Prior to relocation, all utility relocations, if necessary, within the County right of way shall be staked and approved by the County.
- 1.8 Prior to issuance of an encroachment permit, a deposit will be required for review, inspection, and administration services by the Department. All review, inspection, and administration services by the Department rendered in connection with the work covered by an encroachment permit shall be paid for in accordance with the latest Humboldt County Schedule of Fees and Charges for Permits and Services adopted by the Board of Supervisors.

2.0 TRAFFIC CONTROL

- 2.1 Permittee shall be responsible for all traffic control and safety at all work locations in a manner satisfactory to the Department of Public Works. Traffic control operations shall conform to **California Manual on Uniform Traffic Control Devices for Streets and Highways** (FHWA's MUTCD 2009 Edition, as amended for use in California), November 7, 2014, or latest edition, and to the satisfaction of the Department of Public Works. Warning and flagging of motorists at work locations shall be conducted **AT ALL TIMES** by properly trained personnel.

Permittee shall use Caltrans 2015 Standard Plan T13 with T9 for a traffic control plan, when applicable, for closing one traffic lane.

Permittee shall use CAMUTCD Figure 6H-6, Titled "Shoulder Work with Minor Encroachment (TA-6)", when applicable, for working outside of the travelway and not affecting normal vehicle traffic.

Conditions requiring a traffic control plan other than Caltrans T13 with T9 or Fig 6H-6 will require submittal and Public Works approval of a traffic control plan prepared by a Registered Civil Engineer (or Traffic Engineer).

- 2.2 Truck traffic in excess of 12 trips per hour will require a neighborhood Traffic Management Plan (TMP).

The TMP shall be a living document, updated as project conditions change. Weekly on-site meetings shall be performed to review and update the TMP. The TMP shall show road ADT, proposed ADT, duration, staging areas, and sign placement. All temporary construction entrances shall be marked in the field. After site approval is met, access shall be constructed to Caltrans BMP standards

3.0 DRAINAGE PLAN

- 3.1 Applicant shall be responsible to correct any involved drainage problems on the County road as a direct result of the project to the satisfaction of this Department.
- 3.2 Applicant shall minimize the transport of sediment to drainage courses during construction. County Inspector shall be notified by applicant for review and approval of installed erosion control measures.
- 3.3 Applicant shall provide a precise grading plan for all excavations within 50 feet of a County bridge. Drawings shall provide detail to insure that the bridge footings, piers, and headwalls are not undermined.

4.0 TRANSPORTATION PERMITS

- 4.1 All equipment and loads over weight, over length, or over width will require a transportation permit from this Department.

5.0 CLEAN UP AND ROUTINE MAINTENANCE

- 5.1 California Storm Water Quality Association (CASQA) BMPs shall be used to prevent the tracking of material onto County roads. The following BMPs shall be used at a minimum: stone wash pad; rumble racks; sweeping roads on a daily basis.
- 5.2 All construction sites and haul roads shall be maintained, as necessary, to minimize the emission of dust and prevent the creation of a nuisance to adjacent properties. The applicant shall submit a dust control plan for review and approval by the County. The dust control plan shall include CASQA BMPs and provide watering frequency intervals.
- 5.3 All bridges shall be cleared of all sediment and debris on a daily basis or as directed by this Department.

// END //

c: Hank Seemann, Environmental Services Manager
Art Reeve, Deputy Director - Roads
Tom Mattson, Director of Public Works

ATTACHMENT 2
Staff Analysis of the Evidence Supporting the Required Findings

Required Findings: To approve this project, the Hearing Officer must determine that the applicant has submitted evidence in support of making **all** of the following required findings.

The Coastal Zoning Ordinance, Section 312-17.1 of the Humboldt County Code (Required Findings for All Discretionary Permits) specifies the findings that are required to grant a Conditional Use Permit:

1. The proposed development is in conformance with the County General Plan;
2. The proposed development is consistent with the purposes of the existing zone in which the site is located;
3. The proposed development conforms with all applicable standards and requirements of these regulations; and
4. The proposed development and conditions under which it may be operated or maintained will not be detrimental to the public health, safety, or welfare; or materially injurious to property or improvements in the vicinity.
5. The proposed development does not reduce the residential density for any parcel below that utilized by the Department of Housing and Community Development in determining compliance with housing element law (the midpoint of the density range specified in the plan designation) unless the following written findings are made supported by substantial evidence: 1) the reduction is consistent with the adopted general plan including the housing element; and 2) the remaining sites identified in the housing element are adequate to accommodate the County share of the regional housing need; and 3) the property contains insurmountable physical or environmental limitations and clustering of residential units on the developable portions of the site has been maximized.
6. The Appendix to Title III, Division 1 of the H.C.C. specifies that in addition to the required findings specified in Title III, Division 1, §312-39 of the H.C.C., the Hearing Officer may approve or conditionally approve an application for a Conditional Use Permit only if the following Supplemental Findings are made.

§ 312-39.14 Coastal Wetlands

- a) There is no less environmentally damaging feasible alternative;
 - b) The best mitigation measures feasible have been provided to minimize adverse environmental effects; and
 - c) The required mitigation will maintain or enhance the functional capacity of the wetland or estuary.
7. In addition, the California Environmental Quality Act (CEQA) states that one of the following findings must be made prior to approval of any development which is subject to the regulations of CEQA. The project either:
- a) is categorically or statutorily exempt; or
 - b) has no substantial evidence that the project will have a significant effect on the environment and a negative declaration has been prepared; or
 - c) has had an environmental impact report (EIR) prepared and all significant environmental effects have been eliminated or substantially lessened, or the required findings in Section 15091 of the CEQA Guidelines have been made.

Staff Analysis of the Evidence Supporting the Required Findings

To approve this project, the Hearing Officer must determine that the applicant has submitted evidence in support of making **all** of the following required findings.

1. The proposed development must be consistent with the General Plan.

The following table identifies the evidence which supports finding that the proposed development is in conformance with all applicable policies and standards of the Humboldt Bay Area Plan (HBAP) and the Framework Plan (FP).

Plan Section(s)	Summary of Applicable Goal, Policy or Standard	Evidence Which Supports Making the General Plan Conformance Finding
Land Use §4.10 (HBAP) Natural Resources (NR)--to protect and enhance valuable fish and wildlife habitats. Agriculture Exclusive/Prime and Non-prime lands (AE)--to protect prime and non-prime agricultural lands for long term productive agricultural use. Watershed management and management for fish and wildlife habitat are enumerated conditional uses in the AE land use designation.		
		The proposed project seeks improvements in and adjacent to Martin Slough from confluence with Swain Slough to its upper reaches inside the limits of the City of Eureka. The project seeks to remedy existing problems involving limited fish access, simplified fish habitat lacking diversity and niches, large sediment loads, poor sediment routing, lack of riparian habitat, and frequent prolonged flooding that has a negative economic impact on current land uses, i.e., agricultural grazing operations and the municipal golf course. The mouth of Martin Slough is separated from Swain Slough by a berm and tide gates; the existing tide gates were installed in 2014 and was Phase 1 of the project. The project will occur over six or more construction phases. Project Phases 2 and 4, and portions of Phase 5 and Phase 6 will occur within the unincorporated area. The project involves many components that are interrelated involving excavation of accumulated sediment from the Martin Slough channel and the channel of a meander, excavation for construction of a new pond, hauling of excavated sediment both off-site and on-site, improving and upgrading existing drainage infrastructure, installation of large wood habitat structures throughout the project, and extensive planting of wetland and riparian vegetation. The project also involves constructing a new pond, Pond C, and expanded existing ponds to create additional habitat for rearing salmonids, waterfowl, and other aquatic and semi-aquatic species. These pond features will also increase the holding capacity for stormwater flows thereby reducing the duration of inundation and flooding of higher ground. The ponds are situated and designed to provide a range of estuarine habitat with varying salinity, with the highest salinity values being near the tide gates lower value upstream. The various components work together to achieve the project objectives of improving wildlife habitat while also reducing existing flood hazards. Fish and Wildlife Habitat Management and Wetland Restoration are determined to be Compatible Uses when located on Agricultural Lands. The project will enhance wildlife habitats through the restoration of tidal influence and related salt marsh habitat while protecting the remaining pastureland for ongoing agricultural uses. The project as proposed is consistent with the AE land use designation.
Housing §3.16 (HBAP)	Housing shall be developed in conformity with the goals and policies of the Humboldt County Housing Element.	The project is in conformance with the goals and policies of the Housing Element in that the proposal does not involve development of housing and serves to restore and enhance natural resource areas.
Hazards §3.17 (HBAP) Geohazards:	Per §3.26.A: developments permitted in the hazard areas shall be sited and designed to assure stability and structural integrity...while minimizing alteration of natural land forms.	Per the <i>Geologic Setting</i> report, dated May 2013 and prepared by SHN Consulting Engineers & Geologists, Inc., there are no known active faults passing through the project area, although the project is located in a region with numerous onshore and offshore faults, and is in a region of high seismicity (pages 7 and 8). However, the

		<p>site has "pervasive, soft, saturated soil conditions" and due to the volume of excavation and off-hauling present the greatest geotechnical challenge... access roads will need to be robust to remain functional and minimize impacts to natural grounds" (<i>Geotechnical Report</i>, May 2013, SHN Consulting Engineers & Geologists, Inc.). To address these site conditions, the report provides specific recommendations for the design of reinforced temporary haul roads, and to limit heavy equipment and truck traffic to those temporary roads. With the incorporation of these recommendations will maintain a functional access system and minimize environmental impacts (page 11). Upon completion of construction phases, the temporary haul roads will be removed and disturbed areas will be treated with adequate erosion control BMPs and revegetated to further ensure long-term stabilization. The report also makes specific recommendations regarding temporary cut slopes, the Swain Slough berm, and foundations for permanent structures, e.g., the agricultural bridges. The project incorporates the report's recommendations. The project as proposed and mitigated is consistent the policies regarding exposure of people and property to geological hazards.</p>
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Flood:	No critical facilities should be permitted within the 100 year flood plain.	The project site is subject to flooding and is located in the mapped floodplain according to FEMA mapping (effective June 2017). The project, however, does not involve the development of critical facilities, nor will the project engender increases in residential or commercial development on-site or in the vicinity. The restoration activities will improve localized flooding conditions by enlarging the Martin Slough channel which will increase the conveyance of flood waters and improve sediment transport thereby reducing accumulation. Also the ponds to be created and expanded will increase storage capacity for storm flows. Overall, the duration of localized flooding from a two year storm on project site will be reduced from approximately 10 hours to five hours or less measured at Station MS 10+00, (Station MS 10+00 is on the main steam of Martin Slough and west of the barn) per the submitted hydrologic report (<i>Basis of Design Report</i> , August 2015, Michael Love & Associates, page 46). Upstream of the referenced station the reduction in flooding duration is even greater: at the shared property line with the golf course (also the city limit boundary), for a two year storm event the duration of flooding will decrease from approximately 12-13 hours to about 5 hours. Therefore, the project activities will have a beneficial to existing flood conditions.
Fire:	Implementation of recognized fire protection practices.	The project site has a low fire hazard rating according to the General Plan Fire Hazard map. Fire Protection will be provided by Humboldt #1 Fire Protection District.
Tsunami:	Minimize exposure of people and property to tsunami hazard.	The project site is located in the mapped the potential tsunami inundation area. While there is potential for exposure during construction phases, this will be a temporary exposure condition. In the long term the project is not expected to increase the exposure of people or property to tsunami hazards because the project will not directly or indirectly result in new or expanded residential development that would increase density as the project is for estuary enhancement for the benefit of local wildlife and to reduce localized flooding.

<p>Biological Resource §3400 (FP) §3.30 (HBAP)</p>	<p>Protect designated sensitive and critical resource habitats. Per §3.30.B.2.b: modification or repair of existing dikes is permitted within AE lands. Per §3.30.B.4.a.1: fish and wildlife management is permitted development within wetlands planned NR.</p>	<p>The ultimate purpose of the project is to enhance and restore habitat for salmonids and other listed fish species such as the Tidewater Goby, and will enhance biological productivity on site through the restoration of estuarine conditions to Martin Slough and the expansion of wetlands and salt marsh habitat. A number of mitigation measures have been incorporated into the project design to prevent impacts to sensitive and critical resource habitats within the project area. All aspects of the mitigation monitoring plan relative to protection of sensitive species shall be adhered to.</p>
<p>Cultural Resources §3.29.1 (HBAP)</p>	<p>Protect cultural, archeological and paleontological resources.</p>	<p>Archaeological review has been completed for the project areas. A Cultural Resources Investigation report was prepared by Jamie Roscoe of Roscoe and Associates. The report concludes that the proposed project is unlikely to affect cultural or historic resources on site. Additionally, a referral to the North Coastal Information Center recommended approval of the project. An informational note has been included with the Conditions of Approval indicating the steps to be taken should cultural resources and/or human remains be discovered during ground disturbing activities.</p>
<p>Visual Resources §3.40 (HBAP)</p>	<p>Protect and conserve scenic and visual qualities of coastal areas. In Coastal View Areas, no development shall block coastal views to the detriment of the public.</p>	<p>The project site is not located in a Coastal View Area as designated in the Area Plan Resource maps. The project area is visible from public roads and will have temporary visual impacts related to construction activity and the associated equipment and infrastructure necessary to complete the project. The applicant proposes to post explanatory signage regarding the construction activities for observers and passers-by. However, the impacts will be temporary because the project scope extends to revegetation of disturbed areas and monitoring to ensure success of plantings. Additionally, the proposed project will likely enhance the views as restoration goals and objectives are met resulting in a more naturalized landscape.</p>
<p>Public Access §3.50 (HBAP)</p>	<p>To ensure maximum public access and recreational opportunities consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.</p>	<p>The site was not identified in the HBAP existing and potential access inventory. Nor is a listed access way in the vicinity of the subject property. Therefore, the project is consistent with access policies of the HBAP.</p>

2. The proposed development is consistent with the purposes of the existing zone in which the site is located; and 3. The proposed development conforms with all applicable standards and requirements of these regulations. The following table identifies the evidence which supports finding that the proposed development is in conformance with all applicable policies and standards in the Humboldt County Coastal Zoning Regulations.

Zoning Section	Summary of Applicable Requirement	Evidence That Supports the Zoning Finding
§313-5.4 Natural Resources: Fish and Wildlife Management	is enumerated as principally permitted use.	
§313-7.1 Agriculture Exclusive (AE): Fish and Wildlife Management	is enumerated as conditionally permitted use.	
		<p>Within the unincorporated area the proposed project is for restoration activities on over 3,000 linear feet of the Martin Slough channel and its tributaries that includes wetland and riparian habitat restoration with the objectives of enhancing plant, fish, and wildlife habitat, improving water quality, increasing resiliency to climate change, and reducing flooding. Project implementation will occur over six or more construction phases and spanning that many years, and involves development in the unincorporated area and in the City of Eureka. The requisite Coastal Development Permit has been consolidated, and is being processed by the Coastal Commission. Wetland Restoration and Fish and Wildlife Enhancement are principally permitted in the NR zone and is a specified conditionally permitted in the AE zone.</p> <p>The project will convert approximately 7.4 acres of the existing pastureland, that is also seasonal wetland, to salt marsh and freshwater/brackish marsh through the creation of Marsh Plains A and B, Pond C, and the Southeast Tributary Pond. Although the project will convert these pasturelands the project will also decrease the frequency and duration of flooding that currently impacts agricultural operations. Project implementation will enable pasturelands to return to grazing conditions more rapidly than under existing conditions because it will reduce the frequency and duration of flooding on land in and adjacent to the project area. This reduction will in turn will enhance its capacity to support livestock. Hydraulic modeling indicates that a 10-year rainfall event currently results in the project area being strongly inundated for over a week after peak rainfall. After project implementation, inundation from a 10-year rainfall event would be substantially reduced after one day. After two days, all flooded portions of the project area would be drained with the exception of some low-lying areas in the downstream pasture (Table 5-8, <i>Basis of Design Report</i>). Therefore, although the project would convert agricultural land to other land cover types, it would likely have a neutral or beneficial impact on agricultural productivity of the project vicinity overall. The project was referred to the Humboldt County Farm Bureau for comment. They did not provide comment on the project. Staff recommends the project as proposed and mitigated is consistent with the AE land use designation.</p>
Min. Lot Size	NR - Determined during subdivision approval AE – 60 acres	No subdivision is proposed. Parcel sizes in the unincorporated area are approximately 16 acres and 25 acres, and are the result of an approved lot line adjustment (and concurrently processed Coastal Development Permit) approved in November 1998: see file LLA-05-97/CDP-08-97.
Min. Lot Width	NR & AE - Determined during subdivision approval	No subdivision is proposed.
Max. Density	NR & AE - None specified.	No residential development is proposed.
Max. Lot Depth	NR & AE - None specified.	No development affecting depth is proposed.

Yard Setbacks	NR - Front 20'; Rear 10'; Side 5' AE - Front 30'; Rear 30'; Side 30'	No above grade structures are proposed.
Max. Lot Coverage	NR & AE - None specified.	No above grade structures are proposed.
Max. Bldg. Height	NR - 35' AE – None specified	No structures are proposed.
Combining Zones		
Coastal Wetland (W) §313-38	To provide that any development in coastal wetlands will not degrade the wetland, but will maintain optimum populations of marine and freshwater organisms and, where feasible, will enhance wetland resources.	The project will ultimately increase the acreage of riparian scrub/forest, salt marsh, and freshwater/brackish marsh: see Table 1 below. It will enhance wetlands and convert season freshwater wetlands to brackish marsh. The 20 acres of riparian, wetland, and waters restored or enhanced through excavation, new and enhanced channel configurations, and the re-introduction of a muted tidal regime will fully compensate for the 15 acres of mesic grasslands and grazed wetlands impacted by the project. The wetland restoration will provide substantial qualitative enhancement of wetland habitats for the project area as a whole. The project will also remove soil material from other existing channels to deepen or enhance drainage and flood capacity, and increase tidal prism. The channels will not "drain" a wetland; they will become an extension of the Elk River/Martin Slough estuary wetland system. The enhanced channels and surrounding areas will be designed and managed to function as wetlands and riparian habitat with high levels of fish and wildlife habitat function. This will result in an increase in wetland habitat and functioning. As such the project can be considered self-mitigating with respect to wetlands due to the conversion of one type of wetland to another. Staff believes the project as proposed and mitigated is consistent with the wetland requirements.
Flood Hazard Area (F) §313-21	The purpose of these regulations is to minimize public and private losses due to flood and tsunami conditions in specific areas of the County.	See the above discussion under the section 1 for finding the project consistent with Section §3.17 Humboldt Bay Area Plan policies regarding the exposure of people and property to flood hazards (HBAP).

<p>Transitional Agricultural Lands (T) §313-35</p>	<p>The purpose of these regulations is to permit agricultural use as a principal permitted use while providing that development in transitional agricultural lands is conducted in such a manner as to maintain long-term wetland habitat values and minimize short-term habitat degradation within these environmentally sensitive habitat areas.</p>	<p>The proposed project protects long term agricultural opportunities within the more upland portions of the site while providing for enhanced wetland habitat values within areas more suited to salt marsh and tidal influence.</p>
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Table 1. Current and Projected Land Cover Types in Project Area Associated with Various Proposed Project Activities

Land Cover	Current Area (ac)	Projected Area after Project Implementation (ac)
Aquatic	1.6	2.7
Riparian scrub/forest	0.5	9.3
Salt marsh	2.5	5.6
Freshwater/Brackish marsh	0.4	2.4
Agricultural grassland/seasonal wetland	43.0	35.6
Golf course grassland/seasonal wetland	73.0	65.4
Total	121.0	121.0

Supplemental County-Wide Agricultural Use Findings		
Conditionally Permitted Uses in AE §312-18.1	The proposed use will not impair the continued agricultural use on the subject property or on adjacent lands or the economic viability of agricultural operations on the site.	The project will convert approximately 7.4 acres of the existing pastureland, that is also seasonal wetland, to salt marsh and freshwater/brackish marsh through the creation of Marsh Plains A and B, Pond C, and the Southeast Tributary Pond. Although the project will convert these pasturelands the project will also decrease the frequency and duration of flooding that currently impacts agricultural operations. Project implementation will enable pasturelands to return to grazing conditions more rapidly than under existing conditions because it will reduce the frequency and duration of flooding on land in and adjacent to the project area. This reduction will in turn will enhance its capacity to support livestock.
Supplemental Coastal Resource Protection Findings		
Anadromous Fish Streams §312-39.1	<p>Minimum stream flows necessary to protect the anadromous stream population will be maintained;</p> <p>Environmentally sensitive habitat areas will be protected against any significant disruption of habitat values; and</p> <p>Channelizations, dams, or other substantial alterations of rivers and streams will incorporate the best mitigation measures feasible.</p>	The ultimate purpose of the project is to enhance and restore habitat for salmonids and other listed fish species such as the Tidewater Goby, and will enhance biological productivity on site through the restoration of estuarine conditions to Martin Slough and the expansion of wetlands and salt marsh habitat. The project will re-establish a muted tidal prism, which will improve adult salmonid migration and spawning units to upstream tributaries. A number of mitigation measures have been incorporated into the project design to prevent impacts to sensitive and critical resource habitats within the project area. All aspects of the mitigation monitoring plan relative to protection of sensitive species shall be adhered to.
Coastal Streams and Riparian Areas §312-39.4	<p>There are no significant adverse effects on habitat areas;</p> <p>There is no less environmentally damaging feasible alternative; and</p> <p>The best mitigation measures feasible have been provided to minimize adverse environmental effects.</p>	See above discussion.

<p>Coastal Transitional Agricultural Land §312-39.12</p>	<p>There is no less environmentally damaging feasible alternative; The best feasible mitigations are included; and</p>	<p>The project will ultimately increase the acreage of riparian scrub/forest, salt marsh, and freshwater/brackish marsh: see Table 1 below. It will enhance wetlands and convert season freshwater wetlands to brackish marsh The 20 acres of riparian, wetland, and waters restored or enhanced through excavation, new and enhanced channel configurations, and the re- introduction of a muted tidal regime will fully compensate for the 15 acres of mesic grasslands and grazed wetlands impacted by the project. Also, see Coastal Wetland and Transitional Agriculture discussion above.</p>
<p>Coastal Wetland §312-39.14</p>	<p>The functional capacity of the wetland will be maintained.</p>	

4. Public Health, Safety and Welfare.

The project will not be detrimental to the public health, safety and welfare nor will it be materially injurious to properties or improvements in the area because:	Evidence supporting the finding
All reviewing referral agencies have approved or conditionally approved the proposed project design.	See Attachment 4, Referral agency recommendations.
The proposed project is consistent with the general plan.	See previous discussion.
The proposed project is consistent with the zoning.	See previous discussion.
The proposed project will not cause environmental damage.	See following discussion.

5. Residential Density Target: The following table identifies the evidence which supports finding that the proposed project will not reduce the residential density for any parcel below that utilized by the Department of Housing and Community Development in determining compliance with housing element law.

Code Section	Summary of Applicable Requirement	Evidence that Supports the Required Finding
312-17.1.5 Housing Element Densities	The proposed development shall not reduce the residential density for any parcel below that utilized by the Department of Housing and Community Development in determining compliance with housing element law (the midpoint of the density range specified in the plan designation), except where: 1) the reduction is consistent with the adopted general plan including the housing element; and 2) the remaining sites identified in the housing element are adequate to accommodate the County share of the regional housing need; and 3) the property contains insurmountable physical or environmental limitations and clustering of residential units on the developable portions of the site has been maximized.	The parcel is currently planned and zoned for open space and agricultural use. Because the parcel is not planned or zoned for residential uses, it was not included in the 2014 Regional Housing Needs Assessment and is not located within a Housing Opportunity Zone. Regardless, the proposed project will add an additional dwelling unit to the County's housing stock and therefore is in conformance with the standards is the Housing Element.

7. Environmental Impact.

Please see the attached draft Initial Study-Mitigated Negative Declaration.

As required by the California Environmental Quality Act, the initial study conducted by the Planning and Building Department, Planning Division (Attachment 4) evaluated the project for any adverse effects on the environment. Based on a site inspection, information in the application, and a review of relevant references in the Department, staff has determined that there is no evidence before the Department that the project will have any potential adverse effect, either individually or cumulatively, on the environment. The environmental document on file in the Department includes a detailed discussion of all relevant environmental issues.

Because the project was found subject to CEQA and a Mitigated Negative Declaration was prepared, the provisions of Section 711.4 of the California Fish and Game Code apply to this project. Within five (5) days of the effective date of the approval of this tentative map, the applicant shall submit a check to the Planning Division payable to the Humboldt County Recorder in the amount of 2,266.25. Pursuant to Section 711.4 of the Fish and Game Code, the amount includes the Department of Fish and Wildlife (DFW) fee plus the \$50 document handling fee. This fee is effective through December 31, 2017 at such time the fee will be adjusted pursuant to Section 713 of the Fish and Game Code. Alternatively, the applicant may contact DFW by phone at (916) 651-0603 or through the DFW website at www.wildlife.ca.gov for a determination stating the project will have *no effect* on fish and wildlife. If DFW concurs, a form will be provided exempting the project from the \$2,216.25 fee payment requirement. In this instance, only a copy of the DFW form and the \$50.00 handling fee is required. This requirement appears as Condition #12 of Attachment 1 (Section 1).

ATTACHMENT 3

Applicant's Evidence In Support of the Required Findings

Attachment 3 includes a listing of all written evidence which has been submitted by the applicant in support of making the required findings. The following materials are on file with the Planning Division:

- Application Form [in file]
- Plot Plan/Tentative Map Checklist [in file]
- Site Plan Map Set [attached and on CD]
- Project Description dated June 2016 [attached]
- 2017 Updated Wetlands Delineation [on CD]
- 2017 Updated Biological Assessment [on CD]
- 2015 Martin Slough Enhancement Project Basis of Design Report [on CD]
- May 2013 Geotechnical Report [on CD]
- Planting Plan [on CD]
- USFWS request for consultation [on CD]
- Fish and water quality sampling [on file]
- December 19, 2016 California DFW CND occurrence report [on file]
- An Archeological Survey for the Martin Sough Restoration Project: CONFIDENTIAL [on file]
- Proposed Imported Fill Suitability Assessment [on file]

Martin Slough Habitat Enhancement Project

Project Description June 2016

1.0 BACKGROUND AND HISTORY

1.1 Project Area Description

The Martin Slough Enhancement Project is located in and adjacent to the southern portion of the City of Eureka and terminates with its confluence with Swain Slough as shown in Figure 1. Martin Slough is the last (most downstream) tributary to Elk River via Swain Slough. The mouth of Martin Slough is separated from Swain Slough by a berm and tide gates. The Martin Slough watershed includes both City and County jurisdictions, with the project area owned by the City of Eureka (approximately 120 acres) and two private landowners (approximately 40 acres and 110 acres) whose ownerships are comprised of multiple assessor's parcels. The project area is partially within the coastal zone.

The Martin Slough watershed land use includes a mix of residential, agricultural, timberlands, and municipal infrastructure. Humboldt County's Eureka Community Plan includes future residential development of the southeastern portion of the Martin Slough watershed in the Ridgewood Heights area. This currently forested area has been phased out of timber production zone (TPZ) status to allow for residential or mixed-use development. This conversion could modify the watershed hydrology and potentially result in increased storm water runoff. Its actual effect on peak flows within Martin Slough will be dependent on the measures taken by future development to address storm water runoff, currently set for no net increase by the County. Hydraulic modeling conducted during the development of the Martin Slough Feasibility Study (Winzler & Kelly 2006) took into account future build-out and its effects on stream hydrology.

The project area is currently zoned Agriculture Exclusive (60 acre minimum) and Public Facility. Municipal infrastructure directly within the project area includes the City maintained Fairway Drive, three natural gas lines, sewer lines and a pump station, and the Eureka Municipal Golf Course. The Humboldt Community Services District also has existing sewer infrastructure and water lines near Pine Hill Road.

Martin Slough has a watershed area of approximately 5.4 square miles, and natural channel length of over 10 miles with approximately 7.5 miles of potential salmonid fish habitat supporting coho salmon (*Oncorhynchus kisutch*), steelhead trout (*Oncorhynchus mykiss*), and coastal cutthroat trout (*Oncorhynchus clarkii*). The old tide gates partially blocked upstream salmonid migration. New tide gates were installed in 2014 (described below). The lower portion of the watershed flows through low gradient bottomland containing the golf course and pastureland. Many of the stream channels flow from gulches that contain mature second-growth redwood forests. The upper portions of the watershed are either in urban settings, or are recently harvested timber lands slated for future residential and commercial development.

The Martin Slough Enhancement Feasibility Study area consists of the Martin Slough flood plain between Swain Slough and the upper (second) Fairway Drive stream crossing in the lower

Martin Slough Habitat Enhancement Project

Project Description June 2016

Martin Slough watershed (Figure 1). Existing problems that have been identified in the Martin Slough study area include limited fish access, simplified fish habitat lacking diversity and habitat niches, large sediment loads, poor sediment routing, lack of riparian habitat, and frequent prolonged flooding that has a negative economic impact on current land use and which can cause fish stranding and predation as floodwaters recede and leave pools of water on pastures and fairways that become disconnected from the stream channel.

1.2 Project Area History

The Martin Slough and Elk River estuary are part of the larger Humboldt Bay ecosystem that accommodates a variety of waterfowl, wading birds and shorebirds, numerous species of fish and other aquatic organisms, passerines, and raptors. Not much is known about the historic composition of the lower portions of Martin Slough. However, it is apparent from its elevation relative to tidewater and its geomorphic features that the lower portions of Martin Slough consisted of estuarine habitat, likely composed of some salt marsh and slough channels in the lower project area along with other more brackish water habitats, transitioning to tidally-influenced-freshwater wetlands near the upstream end of the project area.

Although much of the historic estuary has been converted to other land use, some estuarine habitat still exists. That habitat has been severely degraded by the installation of tide gates at the confluence of Martin Slough with Swain Slough and other land management practices. These modifications also have had a pronounced effect on flood routing and sedimentation in the lower channel.

The pre-development vegetation of Martin Slough is presumed to have been a mixed Sitka Spruce (*Picea sitchensis*)/willow (*Salix* spp.) forest transitioning to tidal salt marsh. Extreme upper limits of the project area could possibly have been forested by coast redwood (*Sequoia sempervirens*). Transition areas between forest and tidal salt marsh would likely have been comprised of brackish to fresh water and high groundwater tolerant willows, sedges (*Carex* spp.), bulrush (*Scirpus* spp.), and rush (*Juncus* spp.). Salt marsh vegetation probably dominated much of the study area prior to the construction of the berm along Swain Slough. The tidal were likely vegetated by pickleweed (*Sarcicornia virginica*) and salt grass (*Distichlis spicata*). In the non-forested transitional areas brackish vegetation would have probably included soft rush (*Juncus effusus*), silverweed (*Potentilla anserina*), small-headed bulrush (*Scirpus microcarpus*), and tufted hairgrass (*Deschampsia cespitosa*).

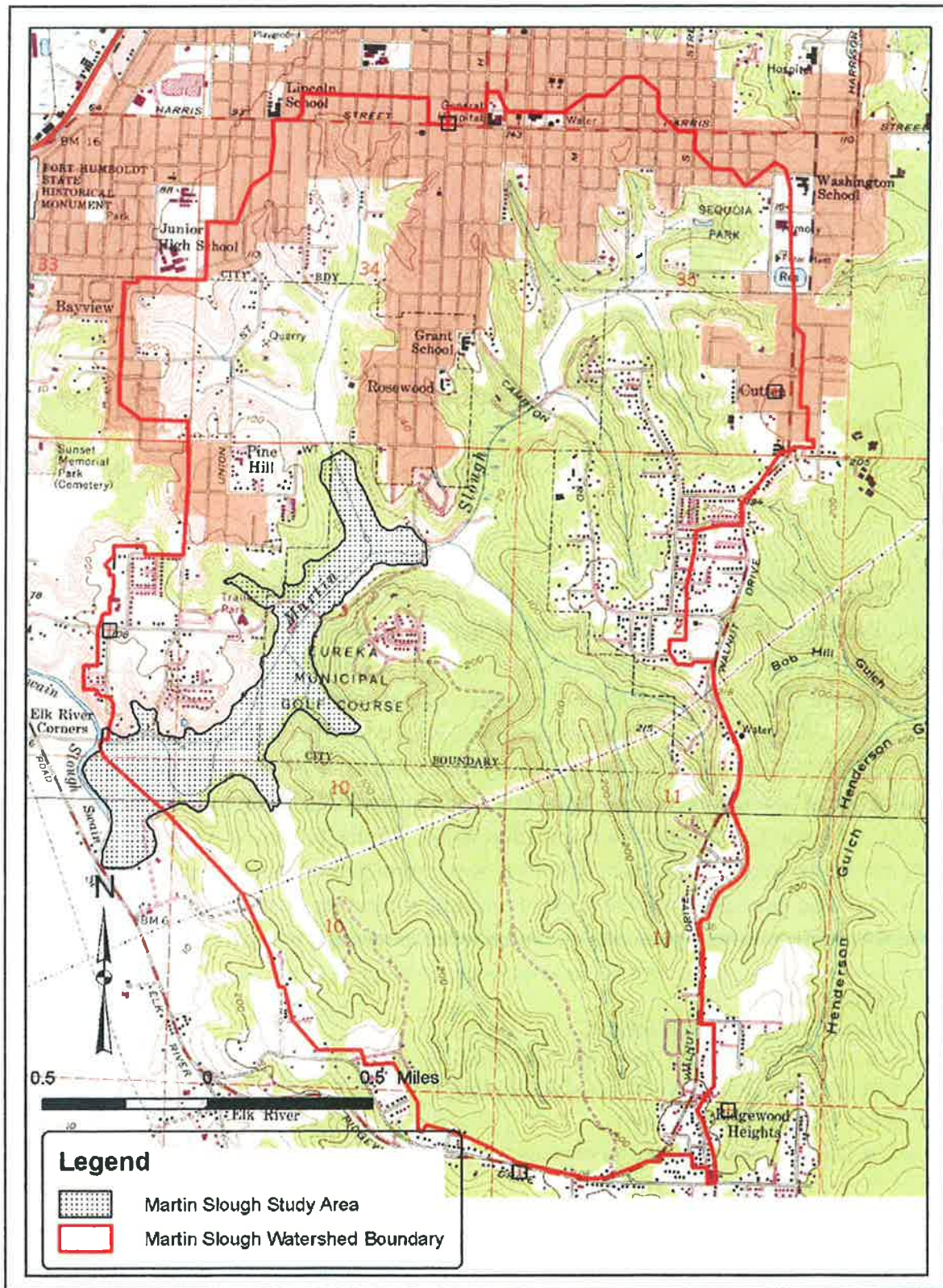


Figure 1. Martin Slough Enhancement Project Site and Watershed Boundary

1.3 Project Purpose and Goals

The purpose of the Martin Slough Enhancement Project is to improve aquatic and riparian habitat and reduce flooding throughout the project area. Specific goals of the Project include the following:

1. Improve fish access from Swain Slough,
2. Increase the amount of riparian corridor and riparian canopy,
3. Reduce flood impacts to current land use,
4. Improve sediment transport,
5. Improve water quality (decrease nutrient impacts, decrease sedimentation, salinity)
6. Improve and increase the diversity and amount of freshwater and saltwater wetland habitat.
7. Protect or relocate utilities to prevent negative project impacts where avoidance is not feasible.

1.4 Project Development

In 2001, the Natural Resources Division of Redwood Community Action Agency (RCAA) hired Winzler & Kelly (W&K), now called GHD, to conduct a feasibility study for an enhancement plan to improve fish access, expand and enhance aquatic habitat, improve sediment transport, and reduce flooding impacts on land use activities within Martin Slough. Michael Love & Associates (MLA), Graham Matthews & Associates (GMA), and Coastal Analysis, LLC (CAL) also participated in conducting early hydrologic and hydraulic assessments for the feasibility study. RCAA managed the study and was responsible for the Technical Advisory Committee (TAC) and landowner coordination. The TAC was comprised of agency representatives, land owners, and land managers plus the team of consultants and representatives of RCAA. The TAC had the following entities represented at one or more meetings:

- City of Eureka
- CourseCo (golf course lessee)
- County of Humboldt (Planning and Public Works)
- CA Department of Fish & Game (Wildlife)
- State Coastal Conservancy
- CA Department of Water Resources
- US Army Corps of Engineers
- NOAA Fisheries
- US Fish & Wildlife Service
- Winzler & Kelly (W&K)/ GHD
- Michael Love & Associates
- Landowners (City of Eureka, Gene Senestraro, Bob Barnum, Northcoast Regional Land Trust)

W&K , MLA, and CAL prepared a planning level report for the project, entitled Martin Slough Enhancement Feasibility Study, Eureka California (W&K et al., 2006). The Feasibility Study characterized current conditions and limiting factors within Martin Slough, developed four alternative enhancement approaches that enhance aquatic and riparian habitat, and conducted hydrologic and hydraulic analyses of the proposed project alternatives.

1.5 Project Alternatives Considered

The following four alternatives were identified and development in the Feasibility Study:

Alternative 1: The No Action Alternative (Existing Conditions)

The No Action Alternative would leave the system as it exists today. This alternative is important for permitting considerations and also for comparing alternatives, allowing a familiar starting point for comparisons to be made.

Alternative 2: No Tide gates or Levee (Full Tidal Influence)

Alternative 2 would result in removing the existing tide gates and the berm along Swain Slough. Based on land and tidal elevations, this alternative would open the majority of the project area to full tidal influence, allowing the system to transform back towards its pre-development state.

Alternative 3: New Tide gates and New Ponds (Muted Tide)

This alternative would consist of removing the existing tide gates, installing new tide gates with a habitat door designed to create a muted tidal prism and facilitate fish passage, increasing the size of existing ponds, and creating new ponds.

Alternative 4: New Tide gates, New Ponds, and Modified Channel (Muted Tide)

This alternative is similar to Alternative 3, but includes improvements to the existing channel and a corresponding larger habitat door to accommodate the larger available tidal prism. This alternative consists of removing the existing tide gates, installing new three new 6' x 6' tide gates in addition to a 2' x 2' habitat door. The 2' x 2' habitat door will be controlled by a muted tide regulator (MTR) and one of the 6' x 6' side hinge doors will be controlled by a separate MTR. The MTRs are used to create a muted tide cycle and facilitate fish passage. Other project actions include increasing the size of existing ponds, creating new ponds, making channel modifications, installing fish and wildlife habitat structures (woody debris), and re-vegetation throughout the project area.

Alternative 4 was selected by the TAC, RCAA, Mr. Senestraro (then owner of the NRLT property), and the City of Eureka to move forward into design and environmental compliance and permitting.

Several different approaches were used to evaluate the alternatives. A simplified numerical model of tide gate hydraulics was created in a spreadsheet to allow for rapid analysis of the

effectiveness of different tide gate designs in providing fish passage and flood routing within the project area. Fish passage analysis of the tide gates was conducted for each alternative. Passage conditions were evaluated using the stream crossing design criteria developed by NOAA Fisheries (2001) and CDFG (2003).

The geomorphic stability of enlarging the Martin Slough channel within the project area to increase conveyance area for both flood flows and a diurnal tidal exchange was analyzed using design guidelines developed for tidal channels. This was done because reintroducing a muted tide cycle into the project area would result in large volumes of water flowing up and down the channel with each tide cycle, changing the fluvial processes that maintain the channel with the potential and likelihood of scouring the channel bed and banks which could cause erosion that could affect existing infrastructure.

The new and expanded ponds would create additional habitat for rearing salmonids, waterfowl, and other aquatic and semi-aquatic species. The ponds would also provide additional storage capacity for storm flows, reducing the amount of time higher ground is inundated. This alternative would increase the size of three existing ponds on the golf course. Two new ponds would be added, one on the golf course and one on the NRLT property. It is anticipated that this alternative would provide a range of estuarine habitat with varying salinity values. The highest salinity values would be adjacent to the tide gates, and the lowest salinity would be found farther upstream. Salinity values would likely fluctuate from summer to winter months, being higher in the summer when less fresh water is entering the drainage. The golf course would likely need to use the upper irrigation pond as their primary irrigation source or use well water. The additional ponds with varying salinity values would be a large benefit for juvenile salmonids and other species. The ponds would be planted with a variety of wetland and riparian vegetation. The new riparian and marsh vegetation in the pasture would be protected by cattle exclusion fencing.

To assist in determining potential impacts and evaluate potential permitting issues for the different alternatives, a wetland and biological reconnaissance investigation was conducted to determine the extent and location of wetlands, and sensitive plant and animal habitats within the potential footprint of the alternatives developed (Winzler & Kelly 2011).

1.6 Proposed Project

Summary of Project Actions:

- Installation of erosion control measures (as per approved Storm Water Pollution Prevention Plan)
- Fish screen installation and fish relocation
- Cofferdam installation
- Stream flow bypass installation
- Construction area stream and pond dewatering
- Temporary construction access installation (including temporary bridges)
- Interior road hardening (installation of filter fabric, geo-grid, and road base)

- Removal of old culverts and installation of new culverts
- Installation of sheet piles along Martin Slough at the barn on NRLT property
- Replacement of the barn culvert with a bridge (including installation of bridge footings)
- Replacement of golf course bridges, including footings
- Installation of gas line scour protection
- Relocation of 130 feet of 6-inch natural gas line
- Decommission and abandonment of a 4-inch natural gas line
- Channel excavation
- New pond excavation
- Existing pond enlargement
- Installation of large wood habitat features in ponds and along channel margins and marsh plains
- Temporary stockpiling of spoils
- Hauling of spoils
- Placement of spoils to repair up to 50% of the berm separating Martin and Swain Slough
- Placement of spoils to fill low spots in the pasture and golf course to create positive drainage to prevent ponding on the floodplain and fish stranding during flood events
- Removal of temporary roads and access points and restoration of pasture areas and golf course fairways to pre-project conditions
- Removal of coffer dams, stream bypass structures, and fish screens
- Installation of cattle exclusion fencing (NRLT property only)
- Installation of wetland & riparian plantings

The proposed project includes multiple components that are all interrelated. These include a new tide gate structure (completed in 2014 but since it is critical to the functionality of the rest of the project a description of it is included here), enlargement of the Martin Slough channel, relocation and decommissioning of buried natural gas lines, installation of scour protection over buried natural gas lines under channels or marsh plains, construction of several tidal ponds, raising of some local low areas on the golf course to elevation 7.0 feet (NAVD88), replacement of multiple agricultural-use and golf course stream crossings (including culverts in the pasture and bridges at the golf course), installation of large wood habitat structures throughout the project, and extensive planting of wetland and riparian vegetation. Hydraulic, hydrologic, and geomorphic analysis were used to develop the interrelated project components through an iterative design process. The total volume excavated and the disposition of the spoils from the expansion of the channel, ponds, and creation of new ponds is presented by phases in the Table 1, Cut and Fill Volumes.

Project Phasing

The project implementation will likely occur in up to 6 or more phases. Phase 1, the Tide Gate Replacement, occurred in 2014. All phases include placement of large wood to enhance habitat, installation and removal of fish exclusion screens, fish capture and relocation, installation and removal of coffer dams, installation of stream bypass equipment (pumps and/ or gravity flow pipes), installation of erosion control measures, and re-vegetation.

Phase 2 implementation will take 3 to 4 weeks and is proposed for the summer of 2017. Phase 2 includes excavating the Martin Slough channel and adjacent Marsh Plain A from the tide gates (station 0+00) to station 9+50, and excavating the southeast tributary and pond. Phase 2 will also include gas line relocation (6-inch line) and decommissioning of the 4-inch line (collectively called the gas line project). The gas line project is described under section 1.6.2 below. The gas line project is being designed by PG&E with the expectation that it will occur in 2017 and would therefore occur in conjunction with phase 2.

Phases 3 through 6 do not have funding yet so their timeline for implementation is uncertain but each phase will take one construction season (June 15 – October 15) with each construction season having a duration of 4 to 12 weeks. As planned, Phase 3 is on City of Eureka property and will include excavation of a new channel for the North Fork, filling in portions of the old channel, excavation of Pond G, and placing fill to eliminate depressions on the floodplain adjacent to the channel that currently pond up and present potential fish stranding opportunities. Phase 3 will create new freshwater-tidally-influenced habitat (Pond G) that California Department of Wildlife biologists have observed to provide ideal rearing conditions for juvenile coho salmon. These actions were recommended for Phase 3 by CDFW biologists because this area is considered to be “replacement” habitat for habitat that will become seasonally brackish habitat upon implementation of all phases and operation of the muted tide regulator and tidal prism at full design level. CDFW biologists have observed that juvenile coho have the highest abundance in winter months in tidally influenced reaches and off-channel ponds that have low levels of salinity (less than 5 parts per thousand – pers. comm. Michael Wallace). Currently Pond E, also known as the 17th hole irrigation pond, provides this type of habitat and CDFW fish sampling has revealed that the juvenile coho from that pond have the highest growth rates of any of their sampling sites around Humboldt Bay. Therefore the North Fork and Pond G enhancements have been proposed as Phase 3 so the use of the habitat by juvenile coho can be verified and observed before Pond E becomes seasonally brackish marsh. However, even under operation of the design muted tide, Pond E will likely exhibit low salinity due to increased freshwater input from seasonal rains and groundwater inflow during the main time of the year when juvenile coho have been documented using Martin Slough (December to June). During the summer months some coho juveniles do reside in Martin Slough and it is expected that freshwater habitat in Ponds D, E, and F will be maintained in the upper layers as the water stratifies, as has been observed during fish sampling and water quality monitoring conducted between 2006 and 2016. Stratification causes a layering effect with the brackish being heavier and occupying the bottom of the pond and fresh water being lighter and occupying the upper part of the water column. Pond E will provide low-salinity habitat during most of this period, even at full design operation of the MTR. Pond F is further upstream and it will have very low salinity or be primarily fresh water during the rainy season, with increasing salinity during low flow times of year but maintaining some freshwater habitat due to stratification. Pond G is expected to remain fresh throughout the year.

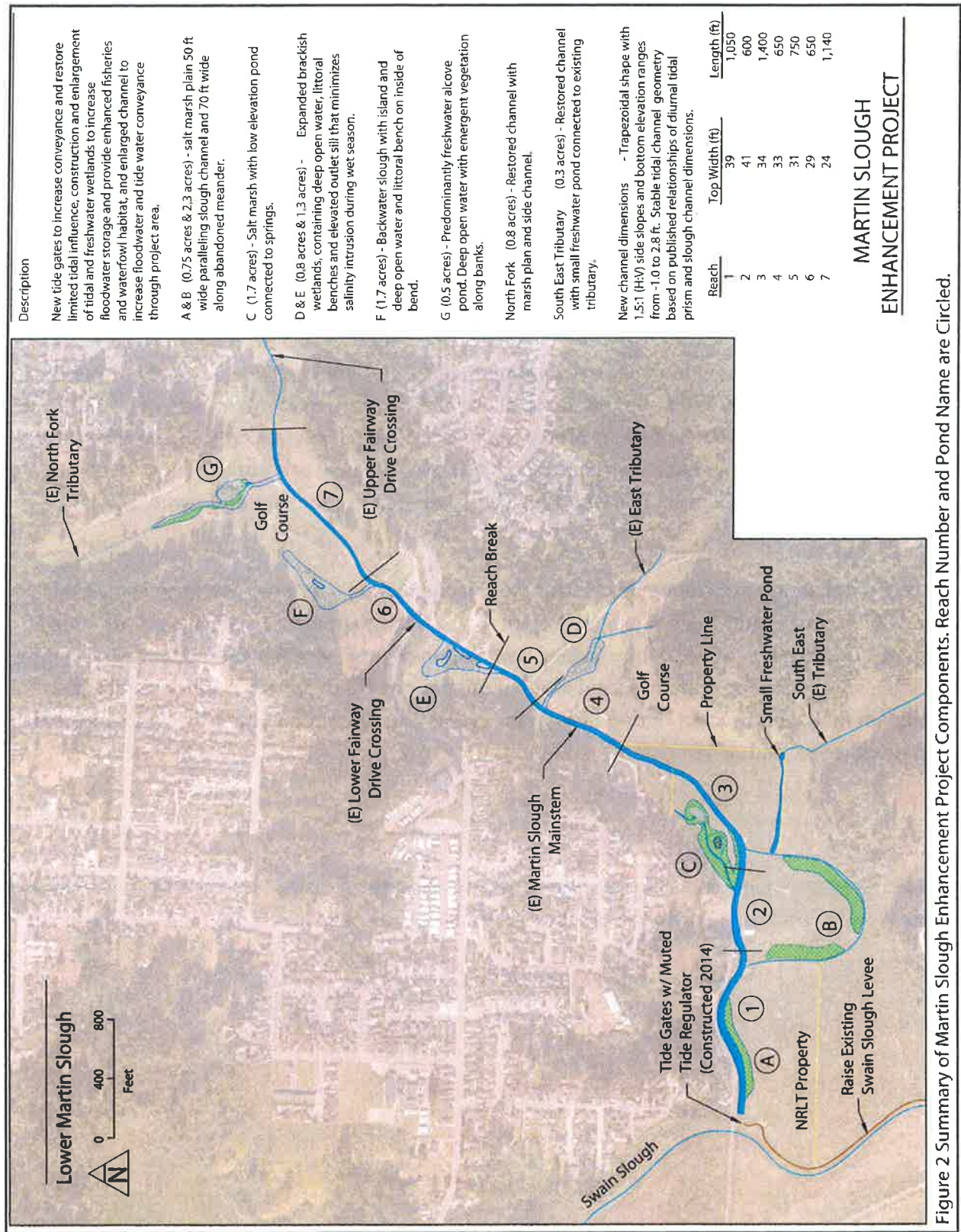


Figure 2 Summary of Martin Slough Enhancement Project Components. Reach Number and Pond Name are Circled.

Figure 2. Summary of Martin Slough Enhancement Project Activities

Phase 4 implementation will occur on Northcoast Regional Land Trust (NRLT) property and will include excavation of the Martin Slough channel from station 9+50 to 30+50, Marsh Plain B and meander stations M 0+00 to M 20+46; replacement of the culverts at meander station M 0+45 and M 20+10; and excavation of Pond C. An existing 5-foot-diameter by 40-foot-long culvert at station MS 13+65 to MS 14+05 will be replaced with a bridge. The old culvert will be removed and disposed at a metal recycling facility. Sheet piles will be installed on both banks from approximately station M 13+25 to M 14+35 at depths ranging from 20 to 32 feet (as per Sheet C-110, S-501, and S-502). Bridge footings will be installed, bridge beams will be installed, and decking and railing will be installed on the bridge. Phase 4 includes installation of large wood habitat structures, grade control weirs, riparian fencing, and re-vegetation. Phase 4 will include installation of scour protection on the 12-inch gas line that crosses the meander at Station M 8+00 and at Station M 18+75.

Phase 5 implementation will include excavating the Martin Slough channel on City of Eureka property from station 30+50 to 46+00, Pond D and the east fork excavation, and Pond E. Phase 5 also includes the installation of scour protection over a 12-inch gas line crossing on the east fork, installation of large wood habitat structures, installation of 6 new bridges and their associated footings, removal and disposal of 6 old bridges, installation of grade control weirs, and re-vegetation.

Phase 6 will include excavating the Martin Slough channel on City property from station 46+00 to 62+80, excavation of Pond F, installation of 4 new bridges, removal and disposal of 8 old bridges, installation of grade control weirs, installation of large wood habitat structures, hauling and disposing of spoils, placement and grading of spoils to fill depressions in the adjacent floodplain that “pond” water during heavy rain events and present potential fish stranding and mortality threats, and re-vegetation.

Table 1. Cut and Fill Volumes by Project Phase and Location

CUT (Excavation) VOLUMES				FILL VOLUMES		
Location	Cut Vol.	Disposal Area	Phase	Location	Fill Vol.	Phase
NRLT:				NRLT/ Vroman:		
Marsh Plain A + MS 0+00 to 9+50	4,545	Swain Slough Berm, White Slough, &/ or other permitted site	2	Swain Slough Berm	125	2
Southeast Trib. & Pond	2,150	Around Barn, White Slough, &/ or other permitted site	2	Around barn	520	2
MS 9+80 6" gas line relocate	311	Re-fill trench	2	MS 9+80 6" gas line relocate	311	2
subtotal - Ph. 2 Exc.	7,006			subtotal - Ph. 2 Fill	956	
City:				subtotal - Ph. 2 off-haul	6,050	
North Fork & Pond G	3,864	610 in old NF channel; 3,254 to GC 3rd, 4th , 7th fairways	3	North Fork	610	3
				GC 3rd Frwy	2,207	3
				GC 4th Frwy	653	3
				GC 7th Frwy	394	3
subtotal - Ph 3 Exc.	3,864			subtotal - Ph 3 fill	3,864	
NRLT:						
MS 9+50 to 30+50 and meander channel	7,414	239 CY to MS 10+50 to 12+30 Channel; 517 CY to MS 13+80 to 15+80; 1,459 to MS 16+50 to 20+50; 5,199 to White Slough or other permitted location	4	MS 10+50 to 12+30 Channel (NRLT)	239	4
Marsh Plain B	6,319	White Slough or other permitted location	4	MS 13+80 to 15+80 Channel (NRLT)	517	4
				MS 16+50 to 20+50	1,459	4
12" Gas Line Scour Protection (NRLT)	10	Re-fill trench	4	12" Gas Line Scour Protection (NRLT)	10	4

Pond C	12,634	White Slough or other permitted location	4			
subtotal - Ph 4 Exc.	26,377			subtotal - Ph 4 fill	2,225	
				subtotal - Ph 4 off-haul	24,152	
Total Excavation Volume for NRLT property	33,383			Total Fill Volume for NRLT property	3,181	
				Total Off-Haul for NRLT Property	30,202	
City:				City:		
MS 30+50 to 46+00	3,478	3,015 to GC 14th & 17th fairways; 463 to White Slough or other permitted location	5	GC 14th Frwy	2,418	5
East Trib & Pond D	2,378	White Slough or other permitted location	5	GC 17th Frwy	597	5
12" Gas Line Scour Protection (City)	10	Re-fill trench	5	12" Gas Line Scour Protection (NRLT)	10	5
Pond E	5,797	White Slough or other permitted location	5			
subtotal - Ph 5 exc.	11,663			subtotal - Ph 5 fill	3,025	
				subtotal - Ph 5 off-haul	8,638	
Pond F	12,634	White Slough or other permitted location	6			
MS 46+00 to 62+80	3,478	White Slough or other permitted location	6			
subtotal - Ph 6 Exc.	16,112			subtotal - Ph 6 fill	0	
				subtotal - Ph 6 off-haul	16,112	
Total Excavation Volume for City	31,639			Total Fill Volume for City	6,889	
				Total off-haul for City	24,750	
				Total Fill Volume for NRLT & City	10,070	
TOTAL EXCAVATION VOLUME NRLT + CITY	65,022			TOTAL OFF-HAUL NRLT & City	54,952	

The following sections summarize project components.

1.6.1 Tide gate Replacement

New tide gates were installed in 2014 to replace the old undersized tide gates where Martin Slough drains into Swain Slough to improve discharge capacity, improve aquatic organism passage, and introduce estuarine conditions into Martin Slough. The tide gate replacement project is described here because it is an integral part of the project and without the new tide gates the rest of the project as described is not feasible. The replacement tide gates were designed to meet multiple objectives:

- Reduce the duration that floodwaters inundate the golf course and pasture.
- Create a muted tide to enter Martin Slough to provide adequate volume of tidal water for sediment and nutrient flushing and enlargement of estuarine habitat.
- Maintain the tidal water below elevation 6 feet (note – all elevations are in NAVD88) to protect adjacent pasture grasses and turf from salt-burn.
- Mimic the natural variability of the tidal cycle within the muted tide range to support a variety of salt marsh and open water habitats.
- Maximize the amount of time the tide gates are open to provide for upstream and downstream movement of aquatic organisms.
- Maximize the amount of time water velocities through the gate openings meet passage criteria for adult and juvenile salmon and steelhead.

A maximum allowable muted tide elevation of 6 feet within Martin Slough was established to avoid brackish waters in the channel affecting the root-zone of the golf course turf, which will have a minimum elevation of 7 feet after several low areas within the golf course are raised. In general, the muted high tide will only reach 6 feet for brief periods during spring (also called king) tides, which generally occur in late fall/ early winter (November- December).

The replacement tide gate structure is similar to the tide gate recommended in the Martin Slough Enhancement Feasibility Study (Winzler & Kelly et al., 2006). The new tide gate has three 6-foot by 6-foot gates that will drain outgoing flows. The three gates were constructed at an elevation of -1.0 feet to allow operation of the muted tide regulator (MTR) mechanism that controls the auxiliary door. The MTR mechanisms are essentially float valves installed on the upstream side of the tide gates, connected to the tide gates with an arm and cam system that closes the gate as the water level rises up to and above the design operation level. The invert of the separate auxiliary door was constructed at an elevation of 1.0 feet. The center gate is top-hinged and the outer two gates are side hinged so that outflow is centered, helping to prevent the potential for undermining of the Pine Hill Road bridge, which is adjacent to the new tide gates. The new tide gate structure was also placed 30 feet further upstream than the old tide gates to create more buffer between the tide gate discharge and the bridge. The auxiliary door is top hinged. The tide gate elevation was selected to balance the benefits of increasing the tidal prism into Martin Slough while at the same time minimizing the amount of potential scour that could occur under the foundation of the adjacent Pine Hill Road Bridge.

On an outgoing tide, all three of the 6-foot by 6-foot doors of the new tide gate open to allow drainage. On an incoming tide, two independently operated doors, one of the 6-foot by 6-foot doors and the 2-foot by 2-foot habitat door, each fitted with its own MTR, close when the water surface elevation within Martin Slough reaches specific elevations, allowing the muted tide within Martin Slough to follow the water surface elevation pattern of the natural tide within the elevation range of the muted tide. When the direction of the tide changes from outgoing to incoming, one of the 6-foot by 6-foot tide gate doors at an invert elevation of -1.0 feet remains open to allow tidal inflow into Martin Slough (MTR Gate). Once the tide reaches an elevation of 4.0 feet in Martin Slough, the MTR mechanism will close the gate. The MTR on the 6-foot by 6-foot door will not be put into operation until the channel and ponds have been excavated to accommodate the design tidal prism. As the channel and pond enhancements are planned to be completed in phases, probably five but possibly more depending on available funding, the two MTR gates will be operated at interim levels according to the amount of tidal prism storage created in the channel and ponds.



Martin Slough Tide gates, upstream side, showing the two MTR floats at left

After the single 6-foot by 6-foot MTR Gate closes, the auxiliary door will continue to allow a small portion of tidal water to flow into Martin Slough. The auxiliary door is necessary to

prolong the duration of upstream fish passage and to create the diversity of tidal elevations necessary to achieve the zonation of salt marsh vegetation that is a project objective. At full build out, once the tide in Martin Slough reaches an elevation of approximately 5.7 feet, an MTR mechanism will close the auxiliary door, preventing saltwater intrusion into Martin Slough above an elevation of 6 feet, to prevent salt burn of the golf course turf and pasture grasses. The interim operation level of the auxiliary door is 5.0 feet, which will allow sufficient tide water to enter Martin Slough to sustain the salt marsh plants that have established along the channel due to the



Martin Slough Tide gates, downstream side, showing the three 6' x 6' gates on the center and left and the 2' x 2' "habitat door" on the right.

leakiness of the old tide gates. With the old tide gates, salt marsh plants (mainly Lyngbye's sedge [*Carex lyngbyei*]) established along the channel margins up to the property line between the City of Eureka/ Golf Course property and the NRLT property, and through the old meander in the pasture except for the area from Station M 9+00 to M 15+00 which receives enough freshwater spring flow to keep that section of the meander fresh (see Sheet C-103).

1.6.2 Pacific Gas & Electric Gas Line Protection, Relocation, and Decommissioning

Phase 2 will include relocation of 130 feet of a 6-inch natural gas line (line L 126A) and decommissioning of a 4-inch gas line (Line L 126B) (the gas line project). Phases 4 and 5 will also include installation of scour protection over a 12-inch gas line (line L 177) where it crosses the meander on NRLT property and the East Tributary on the Golf Course. The natural gas lines are owned and operated by Pacific Gas & Electric (PG&E).

Scour protection will be installed on the 12-inch gas line in three locations where it crosses the stream channel to prevent the loss of soil from channel scour, which would reduce the depth of soil cover over the gas line. The scour protection will include placement of woven geo-textile fabric and Armorflex™, or equivalent, over the gas line as specified on sheet C-505 of the Martin Slough Enhancement Project design plans.

The gas line relocation project is necessary because the enhancement project will result in excavating soil from the channel and adjacent floodplain, reducing the soil cover over the gas lines to less than PG&E's required minimum depth of coverage. Currently the 6-inch gas line does not meet PG&E's standard of 5 feet of soil cover over the gas line, which also applies to gas lines under stream channels, meaning the gas line has to be 5 feet or more below the bottom of the channel. The 4-inch gas line currently meets the standard under the channel but if the marsh plain is extended to this location, the depth of soil cover would not meet PG&E's standards. The 4-inch gas line is a redundant line and PG&E has proposed to decommission it rather than relocate it. PG&E has approved of the plan to relocate the 6-inch gas line (L 126A) and decommission the 4-inch gas line (L 126B) and has agreed that the scour protection designed for the 12-inch gas line (L 177) will be acceptable and the 12-inch line won't need to be re-located. PG&E is developing the plans and specifications for the gas line relocation and decommissioning and will implement the gas line project. PG&E is paying for the design work and will implement the gas line project. The enhancement project proponents are including the gas line relocation and de-commissioning as part of the enhancement project, CEQA document, and permit applications as it is an essential element for future project phases.

The gas line relocation will involve temporarily shutting off the gas supply and venting the remaining gas in the line into the atmosphere. This is a common practice in conducting gas line maintenance and repairs and is not considered dangerous or harmful to the environment as long as standard safety practices are employed (i.e., no open flame or spark generating equipment is operated in the vicinity of the vent while venting is occurring). After the gas is evacuated from the 6-inch gas line, a pit will be excavated at the zero station on the gas line to expose it sufficiently to have access to all sides of the pipe. Installation of 130 feet of new 6-inch gas line will be implemented either using an open trench or directional drilling. Prior to installation of the new gas line, the old gas line will be removed from under the channel area proposed for excavation by the enhancement project. Where the gas line crosses the channel, coffer dams will

be installed upstream and downstream of the crossing and the work area will be dewatered by pumping. Stream flow will be routed around the work area by pumping. Energy dissipation will be employed at the stream bypass outlet to prevent an increase in turbidity downstream of the outlet.

Prior to installing the coffer dams, temporary fish screens will be installed upstream and downstream of the coffer dams. A qualified and licensed fish biologist will capture fish within the work area by seining. Fish will be identified to species and temporarily placed in aerated buckets. The biologist will be present during the de-watering of the work trench to ensure that any fish or amphibians that eluded capture during the seining are captured and relocated during the de-watering. The pump intake will be screened to prevent the intake of aquatic organisms. Once the site is de-watered and all fish and amphibians have been captured, they will be released back into the channel upstream of the de-watered section where they will have access to suitable habitat areas. The intake for the stream bypass will be placed between the upstream fish screen and coffer dam and it will have a screened intake with a mesh size opening no greater than 3/16 inch. The outlet of the stream bypass pipe will be discharged into an energy dissipater to prevent scour of the channel and creation of turbidity in excess of background levels.

If an open trench is used to install the new gas line, shoring will be installed according to OSHA-approved standards as the trench is excavated. The trench will be dug to a sufficient depth to accommodate the new gas line, including the minimum depth of soil cover (5 feet) over the pipe. The design channel depth at this location is -1.0 feet. The top of the new gas line will be at the depth recommended by PG&E engineers to provide allowance for unanticipated-future-channel scour in addition to the minimum depth of soil cover. The maximum elevation for the top of the gas line is anticipated to be -6.0 feet (after relocation).

If directional drilling is used, the station zero pit (on the south side of the channel) will be dug to sufficient size to facilitate the drilling machinery and operators and to sufficient depth to allow installation of the new gas line at a depth of -6.0 feet or greater. Shoring will be installed according to OSHA-approved standards. The gas line will be cut at station zero and at approximately station 130 on the north side of the channel. Sections of old pipe that interfere with the installation of the new gas line or stream flow within the channel upon enhancement project completion will be removed and disposed of at a metal recycling facility. Sections of the old pipe under the pasture, where they will not interfere with the future channel or marsh plain, may be abandoned in place to minimize the disturbance to the pasture. A receiving pit will be excavated on the north side of the channel. Shoring will be installed according to OSHA-approved standards. After the bore hole is created, new 6-inch gas line will be pulled through the bore hole and re-attached to the existing gas line. After the line is pressure tested, the bore holes will be filled in, the coffer dams will be removed, the fish screens will be removed, and the gas line will be put back in service.

The 4-inch gas line will be decommissioned in place as PG&E has determined that it is a redundant line and its removal will not affect service to its customers. After venting, the gas line will be cut and capped. The gas line under the channel will not be removed. Based on pot-holing

conducted by RCAA under the supervision of PG&E, the elevation of the 4-inch gas line was determined to be sufficiently deep under the channel that it will not interfere with stream flow, even after the channel is excavated to -1.0 feet as called for in the project plans.

Phases 4, 5, and 6 of the enhancement project will proceed only after the gas line relocation and decommissioning have been implemented. PG&E, the Coastal Commission, and RCAA have reached an agreement in principle to have PG&E re-locate the 6-inch line and de-commission the 4-inch line to fulfill the wetland enhancement goal of the PG&E Humboldt Bay Generating Station. As part of that agreement, RCAA is including the gas line project in the CEQA document and permit applications for the enhancement project. Phase 3 (Pond G and North Fork Martin Slough enhancement) may proceed prior to the gas line relocation as it involves enhancement of freshwater habitat that will not rely on the muted tide to maintain it.

1.6.3 Tidal Channel

The project area of Martin Slough will be wholly within the limits of tidal influence after project implementation. The upper reaches of the project (North Fork, Pond G, channel upstream of station 60+00) are expected to remain tidally-influenced-freshwater habitat, meaning the water level will fluctuate with tide levels but the water will remain fresh, even at high tide. Though Martin Slough receives freshwater inflows, the hydraulic geometry of the tidal channel of Martin Slough was assumed to be governed by the daily tidal flux rather than less frequent high flow events from upstream. Therefore, the channel cross section and profile design was based primarily on established tidal channel design methodologies.

The contributing tidal prism is defined as the total tidal flux between MHHW and MLLW from channel, pond and overbank storage flowing to a channel reach on an ebb tide. The tidal prism in Martin Slough will be controlled by tidal conditions in Swain Slough, tide gate opening geometry, water surface elevations within Martin Slough, and tidal prism storage within Martin Slough. The iterative process used in solving the regression equations yielded a channel cross section shape and size and a longitudinal profile in equilibrium with the contributing tidal prism.

A design tidal prism of approximately 20 acre-feet was identified to be feasible for the project area. This volume was selected to achieve several project objectives. The design tidal prism is similar to the historical tidal prism determined from measurements of channel widths of the abandoned meander bend on the NRLT property. A tidal prism of this size will result in a stable channel that fits under the existing Lower Fairway Drive bridge crossing and also allow sufficient space for the golf cart path that crosses in that location.

Geomorphically stable tidal channels typically have a U-shape, with nearly vertical banks. Experience with tidal channel restoration projects throughout the West Coast has found that it is most effective to excavate new tidal channels to match the anticipated stable top width and depth, but not attempt to grade them in a U-shape. Rather, the channels are typically built in a trapezoidal shape and allowed to self-adjust, which happens relatively rapidly.

For ease of construction, the Martin Slough tidal channel will be constructed with a trapezoidal shape having side-slopes of 1.5H:1V. Steeper side-slopes can unnecessarily complicate construction. The resulting stable channel and marsh plain geometries will have top widths ranging from 60 feet wide from Station MS 00+00 to MS 11+00 (Sheet C-300, Martin Slough Enhancement Project November 2015), along the lower portions of the Northcoast Regional Land Trust (NRLT) property near the tide gates, to 20 feet wide at Station MS 62+50 (see Sheets C-107, C-300, C-304), which extends to the confluence with the North Fork of Martin Slough. The constructed channel depths, as measured from the top of bank to bottom of channel, will range between 6.3 feet and 3.9 feet.

The new channel profile has a constantly decreasing slope. It matches the existing channel elevation at the upstream end of the project and slopes downward at an average slope 0.25% (0.0025 ft./ft.) until it reaches the confluence with Pond F. Downstream of Pond F the channel slope averages 0.02% (0.0002 ft./ft.), ending at the replacement tide gates.

1.6.4 *New and Expanded Ponds*

The project will include construction of a new tidal marsh complex (Pond C), enlargement of the existing Pond D into an in-channel tidal pond in a tributary flowing into Martin Slough, enlargement of the existing off-channel Pond E, construction of new Pond F, and enlargement of the existing in channel Pond G in the North Fork. A new channel will be constructed to route flow from the North Fork around Pond G, making Pond G an off-channel pond. This design feature is intended to route sediment down the North Fork channel around rather than through Pond G to avoid sedimentation of Pond G.

Tidal marshes and pond sizing is an integral process of the equilibrium tidal channel design. Tidally influenced ponds can be a substantial component of the contributing tidal prism in a receiving channel. Similar to the channel design, pond design was an iterative process between the tidal channel design equations and HEC-RAS model results to identify the optimal pond storage volume and outlet elevations to allow flow exchange and maintain the desired water quality.

Pond Geometry

The ponds were designed to create side channel and off-channel rearing conditions preferred by juvenile coho salmonids. Circulation through the ponds will occur from stream through flow (Ponds D) and tidal backwater effects (Ponds C, E, F, and G). The off-channel nature of the ponds and outlet designs are intended to minimize entry of sediments and control salinity entering from the main channel into the ponds.

All of the ponds were designed to provide a complex shoreline with a variety of water depths to create a range of wetland vegetation and habitat areas. The proposed pond side slopes range from 3H:1V to 10H:1V, depending on location. The more gentle side slopes are intended to simulate point bar geometry, and the steeper slopes to simulate meander channel banks. The side slopes of the ponds will create a shallow littoral area where emergent vegetation will grow. At and above the water line, zones of wetland vegetation will change to more upland vegetation. Below

the permanent pool elevation established by the pond outlets, pond side slopes steepen to 1.5H:1V to create a permanent pool a minimum of 2 to 3-feet deep. Pond bottom elevations were set to the elevation of the adjacent stream channel so that differential draining will not occur.

Pond Outfalls/ Earthen Sills

Ponds E, F, and G will be connected to Martin Slough, or the North Tributary in the case of Pond G, through an elevated pond inlet/outlet channel, referred to as the pond outfall. Martin Slough and the North Fork carry a substantial volume of fine sands and silts and the elevated outfalls will minimize entry of bedload sediment into the ponds, reducing the need for maintenance dredging to maintain pond capacity.

Pond outfall elevations and locations were established to limit winter saltwater intrusion while maximizing the amount of time the pond is hydraulically connected to the channel. Pond outfall elevations were also established to ensure the ponds are flooded twice daily by the tidal cycle. This will allow aquatic organism ingress and egress, and ensure frequent water exchange and flushing between the pond and main channel. Additionally, each pond outfall was set at a different elevation to create a diversity of off-channel conditions and habitats.

The elevations of pond outfalls are intended to minimize entry of bedload sediments from the main channel into the ponds. Some accretion of fine material may occur from smaller grained sediments suspended within the water column during flood events. However, a large volume of the water in the ponds will be flushed twice daily by tidal action, minimizing the amount of time for settlement of smaller particles.

Each of the pond outfalls is 20 feet wide. HEC-RAS modeling indicates peak velocities across the weirs do not exceed 0.5 fps. Therefore, grade controls on the pond outfalls are not proposed, but the outfalls should be composed of relatively resistant material, such as clays.

1.6.5 Tidal Marsh Plains A and B and Tidal Marsh Complex C Design

Approximately 1,970 feet of tidal marsh plain in 3 reaches will be constructed along alternating sides of the tidal channel (Marsh Plain A- 750 ft.) and meander reaches (Marsh Plains B1- 500 ft. and B2- 900 ft.) on the NRLT property. The marsh plains will have a top width of 50 to 75 feet with gentle side slopes of 3H:1V transitioning to existing ground. The width of the marsh plain will gently taper to the existing channel width of approximately 20 feet at the 12 inch gas line crossings in the meander (i.e., the marsh plain will end at the gas line crossing and stream flow will be carried by the channel only). Similarly, to facilitate flow into the new tide gate, the marsh plain width will taper to the channel width of approximately 35 feet immediately upstream of the tide gates.

The design marsh plain will range in elevation from 4.8 to 6 feet, with varying elevations both in cross section and along the channel length. This range in elevations is expected to support a

range of salt marsh plant species. Elevations below 4.5 feet in Martin Slough are not expected to support salt marsh vegetation and will be open channel or mudflat. Elevations between 4.5 and 6 are expected to support a range of marsh communities including *Sarcocornia* Dominated Marsh and Mixed Marsh. It is expected that Mixed Marsh will extend a portion of the way up the 3H:1V side slopes, which will be partially inundated by higher tides.

Marsh Plains A and B and Tidal Marsh Complex C are expected to be brackish to saline most of the year and are expected to support tidal marsh vegetation, thus were designed specifically to support salt marsh plant communities. Ponds D through F are expected to experience brackish to freshwater conditions throughout the year and are expected to support more freshwater marsh species. Pond G is expected to remain fresh year-round but it will be tidally-influenced and pond-water elevations are expected to vary with the tides.

1.6.6 *Salinity and Expanded Aquatic Habitat*

The salinity modeling indicated that salinities fluctuate up and down with the tide and with freshwater inflows. Salinities increase in the downstream direction, with rising tides, and with drops in freshwater inflows. Conversely, salinities fall during freshwater inflow events and when the tide is falling.

During the rainy season, salinities greater than 15 ppt extend upstream in the Martin Slough Mainstem to Pond D. Tidal marsh Complex C (Pond C) will be brackish, but the upstream end of the pond which drains freshwater springs may have salinities less than 4 ppt. Similarly, Pond D is slightly brackish at the downstream end, but becomes fresher upstream in the pond closer to the tributary outfall where salinities are approximately 5 ppt. Pond E has varying salinities of 0 ppt to approximately 6 ppt, similar to the mainstem at its outfall location. Ponds F and G, located in the upper reaches of the Martin Slough Mainstem, are expected to have salinities less than 1 ppt.

At the end of the dry season when stream baseflows are at their lowest, salinities up to 15 ppt are expected to extend from Swain Slough to the upstream head of Pond E. A similar situation may occur for Pond D. Pond E is located where channel salinities drop to a more brackish level. Pond E has salinities of approximately 6 ppt, similar to the mainstem at its outfall location. Ponds F and G are expected to maintain salinities less than 5 ppt. These predicted concentrations are depth averaged. Stratification is expected to occur during these low flow periods, with freshwater dominating the top portion of the water column and high salinities near the bottom.

The Project will increase the amount of tidal channel and bordering pond habitats in the Project area. This additional aquatic habitat will also improve hydraulic connectivity. The Project will re-establish a muted tidal prism, which will improve adult salmonid migration and spawning runs to upstream tributaries. Table 2 contains the existing and projected aquatic habitat for the

expanded pond areas only. The table does not include the expanded Martin Slough channel width and depth which would also provide increased aquatic habitat.

Table 2. Existing and projected aquatic habitat for expanded pond and marsh plain areas in the Martin Slough Project Area.

Expanded Ponds	Existing Habitat (Acres)	Projected Habitat (Acres)
March Plain A	0	0.75
March Plain B	0	2.3
Pond C (brackish)	0	1.7
Pond D (fresh)	0.1	0.8
Pond E (Hole 17) (brackish)	0.2	1.3
Pond F (seasonally brackish)	0	1.7
Pond G (fresh)	0.10	0.5
North Fork (fresh)	0.12	0.8
Southeast tributary	0	0.2
SUBTOTAL	0.52	10.05
Riparian Habitat	.50	9.23
TOTAL HABITAT AREA	1.02	19.28

1.6.7 Golf Course Improvements

Currently, the golf course has numerous low areas on the floodplain that do not drain after storm events because the water ponds, increasing the potential for stranding of coho salmon and tidewater goby as floodwaters recede and leave ponds that become isolated from the creek. As part of the project design, the low areas within the golf course that pond will be filled to a minimum elevation of 7 feet so they drain towards the channel, reducing the likelihood of fish stranding and improving drainage.

The old tide gates had limited outflow capacity that increased the amount of time necessary for storm events to drain out of Martin Slough. The new tide gates have a much larger outflow capacity, reducing the amount of time it takes for flood flows to drain from Martin Slough. Channel excavation and replacement of the culvert at station 13+70 (on NRLT property) will improve conveyance of floodwaters and further reduce the duration of flooding. The added

channel capacity and the enlarged ponds will also provide flood water detention, which will reduce the extent of flooding on adjacent pasture and golf course fairways.

1.6.8 Construction Phasing and Earthwork Volumes

Project construction will be phased over multiple construction field seasons. Each season may last up to 120 days, the duration will be determined by funding availability and logistics of minimizing impacts and revenue losses to the golf course. Replacement of the tide gate structure was completed in the first construction season (Phase 1). Excavation of the new slough channel up to approximately Station 8+60, Marsh Plain A, and the southeast tributary on the NRLT property are scheduled for Phase 2, expected to be implemented in 2017. Pond G and the north fork project will be completed in Phase 3. Currently sufficient funding has been secured to complete the main channel up to approximately Station 8+60, and the southeast tributary on the NRLT property in Phase 2 (2017). Ponds C, D, E, and F would occur in the upstream direction in subsequent construction seasons, projected as Phases 4, 5, and 6 (see Table 1. Cut and Fill Volumes by Project Phase and Location, for construction phasing). In consideration of comments received from the California Department of Fish and Wildlife and the National Marine Fisheries Service regarding the need to maintain habitat for juvenile coho salmon similar to that provided now by Hole 17 pond, i.e., tidally-influenced but primarily freshwater, enhancement of Pond G will occur as soon as funding is available so the new habitat may be observed and fish utilization can be monitored before introducing the full muted tide which will turn Pond E seasonally brackish. Enhancement of Pond G is intended to replace the fresh water habitat currently provided by Pond E. Enhancing Pond G will ensure that the project area will provide an equal or greater amount of freshwater habitat as currently exists when the tide gates are replaced and the muted tide is introduced.

Sediment excavated from the channel and ponds will be used onsite to raise adjoining ground elevations and repair the Swain Slough berm or hauled off-site for beneficial reuse. Table 1 contains the earthwork cuts and fills for the project based on the 100% Design Plans and divided into anticipated construction phases two through six.

Potential off-site reuse areas include spreading on nearby agricultural lands or re-use on another wetlands enhancement project in the Humboldt Bay area. The US Fish & Wildlife Service, Humboldt Bay National Wildlife Refuge (HBNWR), is a potential spoils disposal location. The USFWS has a failing dike around White Slough, which, if it fails, will expose the Highway 101 Hookton Overpass to wave action and erosion. Therefore the HBBNWR is seeking fill to use in a salt marsh restoration project to raise the level of the subsided land behind the dike so it will be high salt marsh rather than open water, thus creating a buffer between the open water and wave action and the overpass. Table 1, estimated excavation (cut) and disposal (fill) volumes by project phase, includes the proposed disposal locations.

1.6.9 Construction Techniques and Temporary Disturbance

The primary excavation methods that will likely be utilized include track-mounted excavators, scrapers and bull-dozers. Excavated material will be loaded into either belly- or end-dump trucks and hauled to the reuse areas. The contractor may choose to use track trucks to transport excavated material (spoils) to either an on-site re-use location or to a stockpile location from which larger street-legal trucks will be loaded for transport to its final destination. It will be the responsibility of the contractor to ensure the haul trucks are street legal and that local speed and

weight limits are obeyed. The Contractor will also be responsible for developing and submitting for review by the Construction Manager a Traffic Control Plan prior to construction commencement. Hauling the excavated material from the project area to reuse sites will require a fleet of dump trucks operating continuously during the excavation activities. Table 3 shows the range of project construction equipment estimates for any given construction season.

Table 3. Estimates of Equipment Needed for Project Construction

Equipment Type	Estimated Quantity
Excavators	1-5
Scrapers	1-5
Dozers	1-5
Loaders	2-4
Dump Trucks	2-10
Small Tractors	1-3
Compactors	1-3
Graders	1-2
Water Trucks	1-3
Small Crane	1

Temporary construction areas will be needed to stage equipment, store material and transport material. Temporary construction areas will be located within locations already identified as permanent impacted areas such as excavation areas or areas within close proximity as depicted on the 100% Design Plans. Temporary construction activities outside permanent impact areas will be limited to temporary construction buffers, haul routes, material and equipment staging/stockpiling areas, and temporary egress/ingress areas adjoining City and County Roads and as shown on the 100% Design Plans. Areas identified as temporary construction areas will be restored to pre-construction conditions once construction is complete. Temporary haul roads and other high traffic areas will be de-compacted and restored back to pre-construction soil densities. Restoration of temporary construction disturbance areas will be specified in the final specifications.

1.6.10 Temporary Haul Roads

The construction of temporary haul roads may be required to transport excavated materials from the channel corridor to City, County, and State Roads depending upon the final re-use areas. Haul roads will also provide stable working and staging areas for excavation and loading activities. Haul road construction will depend on subgrade suitability, the size of the transport equipment to be used, the intensity of use, excavation/reuse locations, and identification of sensitive habitats and species. Temporary haul road construction could include proof-rolling native subgrade to provide a non-yielding surface or placement of crushed rock or river-run gravel over woven or non-woven geotextile fabric and geo-grid. Locations of anticipated

temporary haul roads will be within the limits of temporary construction disturbance as depicted on the 100% Design Plans.

1.6.11 Construction Erosion and Sediment Control BMPs

Prior to Project construction, a Storm Water Pollution Prevention Plan (SWPPP) will be developed, submitted to, and approved by the North Coast Regional Water Quality Control Board (RWQCB) and implemented during construction. As part of the SWPPP, Best Management Practices (BMPs) for controlling soil erosion and the discharge of construction-related contaminants will be developed and monitored for successful implementation. Individual SWPPPs may be prepared for various construction components or phases (e.g., demolition of existing site structures, grading of one parcel, dredging channels, etc.). BMPs that will be implemented as part of the SWPPP will include:

- Cofferdams or other temporary fish barriers/water control structures will be placed in the channel during low tide, and will only be removed during low tide (if possible), after work is completed.
- Because cofferdams will be installed and the channel will be dewatered prior to excavation, equipment will not be operated directly within tidal waters or stream channels of flowing streams, after fish removal efforts have been completed.
- Silt fences and or silt curtains will be deployed in the vicinity of the cofferdams and at excavation of sloughs at culvert installation and removal areas to prevent any sediment from flowing into the creek or wetted channels. If the silt fences are not adequately containing sediment, construction activity will cease until remedial measures are implemented that prevent sediment from entering the waters below.
- Sediment sources will be controlled using fiber rolls, straw, filter fabric, sediment basins, and/or check dams that will be installed prior to or during grading activities and removed once the site has stabilized.
- Erosion control may include seeding, mulching, erosion control blankets, plastic coverings, and geotextiles that will be implemented after completion of construction activities.
- Excess water will be pumped into the surrounding fields to prevent sediment-laden water from entering the stream channel. If necessary, shallow-temporary-receiving basins (settling basins) will be excavated to receive and hold construction site water and allow it to percolate into the soil to avoid introduction of silty or turbid water into Martin Slough. Sod will be skimmed off the settling basin and temporarily stockpiled, as will soil from the basin, until the basin is no longer needed, at which time the soil will be replaced into the basin and the sod will be re-planted. The MTRs will be taken out of operation during excavation to prevent tide water from entering Martin Slough and active work areas. This will reduce the amount of water in the work areas and the volume of water that will need to be evacuated from the construction site and discharged onto fields or into settling basins.

- Appropriate energy dissipation devices will be utilized to reduce or prevent erosion at discharge end of dewatering activity.
- Turbidity monitoring will be conducted in Martin Slough throughout the site stabilization period to ensure that water quality is not being degraded. Turbid water will be contained and prevented from being transported in amounts that are deleterious to fish, or in amounts that could violate state pollution laws. Silt fences or water diversion structures will be used to contain sediment. If sediment is not being contained adequately, as determined by visual observation, the activity will cease until remedial actions to correct the problem are implemented.
- Construction materials, debris, and waste will not be placed or stored where it can enter into or be washed by rainfall into waters of the U.S./State.
- Upland areas will be used for equipment refueling. If equipment must be washed, washing will occur where wash water cannot flow into wetlands or waters of the U.S./State.
- Operators of heavy equipment, vehicles, and construction work will be instructed to avoid sensitive habitat areas. To ensure construction occurs in the designated areas and does not impact environmentally sensitive areas, the boundaries of the work area will be delineated with temporary fencing or marked with flagging.
- Equipment, when not in use, will be stored outside of the slough channel and above high tide elevations.
- All construction equipment will be maintained to prevent leaks of fuels, lubricants, or other fluids into the slough. Service and refueling procedures will not be conducted where there is potential for fuel spills to seep or wash into the slough.
- Extreme caution will be used when handling and/or storing chemicals and hazardous wastes (e.g., fuel and hydraulic fluid) near waterways, and any and all applicable laws and regulations will be followed. Appropriate materials will be on site to prevent and manage spills.
- All trash and waste items generated by construction or crew activities will be properly contained and removed from the project area.
- After work is completed, project staff will be on site to ensure that the area is re-contoured as per approved specifications. If necessary, restoration work (including revegetation and soil stabilization) will be performed in conformance with the Revegetation and SWPP plans.

1.6.12 Construction Dewatering and Stream Diversion Sequencing

During excavation within the channel, management of the stream flow from Martin Slough tributaries will be required throughout the construction period. Preventing inflow into the active work zones (both tidal and freshwater) will be required to prevent aquatic and non-aquatic

organisms from entering the construction site, to reduce the water to be managed in the active work area, and to reduce moisture content in the excavated soils. The muted tide regulators (MTRs) will be taken out of service during construction activities so no tide-water will enter the Martin Slough channel and ponds. This will reduce the amount of water the excavation contractor has to deal with when de-watering a work area. Inflow control practices include placement of temporary coffer dams to isolate the active work zone. The coffer dams may be comprised of native material, washed gravel encased with an impermeable geotextile or visqueen liner in combination with ecology blocks, and/ or water bladders. A combination of pumped and gravity diversion pipes will be used to route flow around the active work areas. Fish screens will be installed immediately upstream from the coffer dams to prevent aquatic organisms from being transported into the bypass pipe.

For all construction phases and areas, diversion of freshwater from the upstream coffer dam will be pumped or gravity piped and discharged onto pastures or fairways where it will be allowed to infiltrate into the ground. If needed to prevent construction site water from returning directly to the stream through overland flow, shallow temporary holding basins may be excavated in the pasture or fairways. Pondered storm or groundwater in construction areas will not be dewatered by project contractors directly into adjacent surface waters or to areas where they may flow to surface waters unless authorized by a permit from the North Coast Regional Water Quality Control Board (NCRWQCB). In the absence of a discharge permit, pondered water (or other water removed for construction purposes), will be pumped into adjoining fields to infiltrate if suitable, baker tanks, or other receptacles. If determined to be of suitable quality, some of this water may be used on-site for dust control purposes. The Contractor will be required to submit for review and approval by the Construction Manager a Dewatering and Creek Diversion Plan that shall include the proposed dewatering and diversion techniques and schedule of operations. The following construction phases and associated dewatering and diversions activities are proposed to occur in the order presented below. For all construction within the channel or existing ponds, as water within the construction area is pumped out and the channel or pond is de-watered, a fish biologist will observe and capture any fish as the water level is drawn down to ensure the fish are captured and relocated without harm.

Lower Martin Slough Channel (MS 0+00 to MS 46+00), Including Ponds C and D: Cofferdams will be placed at the upstream and downstream end of the restoration area. Diverted flow will be pumped, gravity piped, or ditched and conveyed downstream of the active work zone. Prior to placement of temporary coffer dams, a qualified biologist will utilize seines to corral fish out of the construction limits and into adjoining waters.

Upper Martin Slough Channel Including Pond E and F: Prior to placement of temporary coffer dams, a qualified biologist will utilize seines to corral fish to areas out of the construction limits and into adjoining waters including the newly constructed Ponds C and D. Fish that cannot be corralled to areas outside of the construction limits will be captured and relocated as the water is drawn down during de-watering.

Pond G: During the instream channel excavation a combination of pumped and/or gravity diversion pipes and or ditches will be used to route flow around the active work areas. Nuisance water (i.e., turbid water seeping into excavated areas from ground water) will be pumped to adjacent fields for infiltration or into settling basins. Clean water (e.g., water from Martin Slough and contributing tributaries) will be diverted using coffer dams that will prevent clean freshwater and clean tidal water from entering the excavation. Cofferdams will be placed in the Martin Slough channel immediately upstream and downstream from work sites, which will typically be 1,000 feet long or less. The coffer dams will preclude freshwater and tidal inflow into the work zone during construction.

Golf Course Improvements: Currently, the golf course has numerous low areas on the floodplain that are slow to drain after storm events because the water does not have a flow path back to the channel. This increases the potential for stranding of coho salmon and tidewater goby as floodwaters recede and leave shallow pools that are isolated from the creek. As part of the project design, the low areas within the golf course that pond will be filled to a minimum elevation of 7 feet so they drain towards the channel, reducing the likelihood of fish stranding and improving drainage. Additionally, the new tide gates have a much larger outflow capacity, reducing the amount of time it takes for floodwaters to drain from Martin Slough. Eliminating shallow pools where fish can become stranded will also improve drainage.

1.6.13 PG&E Gas Line Relocation and Decommissioning

Phase 2, or a subsequent phase, will include relocation of 130 feet of a 6-inch natural gas line (line L 126A) and de-commissioning of a 4-inch gas line (Line L 126B) (collectively called the gas line project). Phases 4 and 5 will include installation of scour protection (see sheet C-505) over a 12-inch gas line (line L 177) where it crosses the meander on NRLT property (see 100% designs, sheet C-102 and C-103) and the East Tributary on the Golf Course (see 100% designs, sheet C-105). The natural gas lines are owned and operated by Pacific Gas & Electric (PG&E).

Scour protection will be installed on the 12-inch gas line in three locations where it crosses the stream channel to prevent the loss of soil from scour by stream flow or tidal exchange. Scour would reduce the depth of soil cover over the gas line. The scour protection will include placement of woven geo-textile fabric and Armorflex™ or equivalent over the gas line as specified in the design plans.

The gas line project is necessary because the enhancement project would result in excavating soil from the channel and adjacent floodplain and reduce the soil cover over the gas lines to less than PG&E's required minimum depth of coverage. Currently the 6-inch gas line does not meet PG&E's standard of 5 feet of soil cover over the gas line, including under stream channels. The 4-inch gas line meets the standard under the channel but if the marsh plain was extended to this location, the depth of soil cover would not meet PG&E's standards. However it is a redundant line and PG&E has proposed to decommission it rather than relocate it. PG&E has agreed to relocate the 6-inch gas line (L 126A) and decommission the 4-inch gas line (L 126B) and has agreed that the scour protection designed for the 12-inch gas line (L 177) will be acceptable as a substitute for relocating it.

The gas line relocation will be planned so it occurs while the channel is de-watered for channel and marsh plain excavation. Prior to installing the coffer dams, temporary fish screens will be installed upstream and downstream of the coffer dams. A qualified and licensed fish biologist will capture fish within the work area by seining. Fish will be identified to species and temporarily placed in aerated buckets. Cofferdams will be installed upstream and downstream of the crossing and the work area will be dewatered by pumping. Stream flow will be routed around the work area by pumping. Energy dissipation will be employed at the stream bypass outlet to prevent an increase in turbidity downstream of the outlet. The biologist will be present during the de-watering of the work trench to ensure that any fish or amphibians that eluded capture during the seining are captured and relocated during the de-watering. The pump intake will be screened to prevent the intake of aquatic organisms. Once the site is de-watered and all fish and amphibians have been captured, they will be released back into the channel at least ¼ mile upstream of the de-watered section. The intake for the stream bypass will be placed between the upstream fish screen and coffer dam and it will have a screened intake with a mesh size opening no greater than 3/16 inch. The outlet of the stream bypass pipe will be discharged into an energy dissipater to prevent scour of the channel and creation of turbidity that will exceed background levels.

Gas line relocation will involve temporarily shutting off the gas supply and venting the remnant gas in the line into the atmosphere. This is a common practice in conducting gas line maintenance and repairs and is not considered dangerous or harmful to the environment as long as standard safety practices are employed (i.e., no open flame or spark generating equipment is operated in the vicinity of the venting while venting is occurring). After the gas is evacuated from the 6-inch gas line, a pit will be excavated at the zero station on the gas line to expose it sufficiently to have access to all sides of the pipe. Installation of 130 feet of new 6-inch gas line will be implemented either using an open trench or directional drilling. Prior to installation of the new gas line, the old gas line will be removed.

If an open trench is used to install the new gas line, shoring will be installed according to OSHA-approved standards as the trench is excavated. The trench will be dug to a sufficient depth to accommodate the new gas line, including the minimum depth of soil cover (5 feet) over the pipe. The design channel depth at this location is -1.0 feet (note – all elevation references are in NAVD 88). The top of the new gas line will be at the depth recommended by PG&E engineers to provide allowance for unanticipated-future-channel scour in addition to the minimum depth of soil cover. The maximum elevation for the top of the gas line is anticipated to be -6.0 feet (after relocation).

If directional drilling is used, the station zero pit (on the south side of the channel) will be dug to sufficient size to facilitate the drilling machinery and operators and to sufficient depth to allow installation of the new gas line at a maximum depth of -6.0 feet. Shoring will be installed according to OSHA-approved standards. The gas line will be cut at station zero and at approximately station 130 on the north side of the channel. Sections of old pipe that interfere

with the installation of the new gas line or stream flow within the channel upon enhancement project completion will be removed and disposed of at a metal recycling facility. A receiving pit will be excavated on the north side of the channel. Shoring will be installed according to OSHA-approved standards. After the bore hole is created, new 6-inch gas line will be pulled through the bore hole and re-attached to the existing gas line. After the line is pressure tested, the bore holes will be filled in, the coffer dams will be removed, the fish screens will be removed, and the gas line will be put back in service.

The 4-inch gas line will be decommissioned in place as PG&E has determined that it is a redundant line and its removal will not affect service to its customers. After venting, the gas line will be cut and capped. The gas line under the channel will not be removed. Based on pot-holing conducted by RCAA under the supervision of PG&E, the elevation of the 4-inch gas line was determined to be sufficiently deep under the channel that it will not interfere with stream flow, even after the channel is excavated to -1.0 feet as called for in the project plans.

Phases 5 and 6 of the enhancement project will proceed only after the gas line relocation and decommissioning have been implemented. Phase 4 will not be affected by the gas line relocation/decommissioning project and it will proceed as funds are available. PG&E, the Coastal Commission, and RCAA have reached an agreement in principle to have PG&E re-locate the 6-inch line and de-commission the 4-inch line to allow the upstream portions of the Martin Slough Enhancement Project to proceed and to fulfill the wetland enhancement acreage goal of the PG&E Humboldt Bay Generating Station. As part of that agreement, RCAA is including the gas line project in the CEQA document and permit applications for the enhancement project.

1.6.14 *Revegetation*

The 100% Design Plans include the planting areas and species densities for the project area. The goal is to create native, forested riparian, wetland, and tidal marsh habitats along the Martin Slough channel and expanded ponds. The excavated reaches of Martin Slough and expanded ponds will be revegetated with low growing brackish and freshwater wetland (sedges and rushes) and riparian forest (Sitka spruce, willow, wax myrtle, and alder). Plant material, to the extent feasible, will be salvaged from the project impact footprint. All areas disturbed during grading and other construction activities will be treated with erosion control seeding with native grasses, forbs and shrubs. A combination of active planting and passive revegetation with invasive plant control will be used. Active planting will include re-seeding of pasture and golf course fairways, planting of trees and shrubs within the riparian zone as identified in the planting plan. Brackish wetlands will be re-vegetated with a combination of active planting and passive revegetation which will include monitoring and invasive plant removal. Exclusion fencing will be constructed around the perimeter of the riparian forest and along the channel through the pasture to protect the plantings. Fencing is not needed on the golf course (City) property as no cattle are allowed there.

Active vegetation maintenance will be regularly performed to ensure that the target riparian forest habitat develops along the riparian corridor areas. Options for limiting undesirable

vegetation include intermittent controlled flash grazing (cattle, goat, or sheep), manual removal, and mechanical removal. Special attention will be given to non-native invasive species such as dense-flowered cordgrass and maintenance activities will be coordinated with regional eradication programs, including both timing and methods for removal of specific species. If grazing is employed, exclusion fencing will be placed to protect channel banks, newly establishing revegetation plantings, and areas of naturally recruiting desirable native plants. Flash grazing may be carefully employed to control weed cover in active planting areas and natural recruitment areas but will be managed to avoid excessive damage to native plantings and recruits.

1.6.15 Construction Techniques and Temporary Disturbance

The primary excavation methods that will likely be utilized include track-mounted excavators, scrapers, and bull-dozers. Excavated material will be loaded into either belly- or end-dump trucks and hauled to the reuse areas. It will be the responsibility of the contractor to ensure the haul trucks are street legal and that local speed and weight limits are obeyed. The Contractor will also be responsible for developing and submitting for review by the Construction Manager a Traffic Control Plan prior to construction commencement. Hauling the excavated material from the project area to reuse sites will require a fleet of dump trucks operating continuously during the excavation activities. Table 3 shows the range of project construction equipment estimates for any given construction season.

Table 3. Estimates of Equipment Needed for Project Construction

Equipment Type	Estimated Quantity
Excavators	1-5
Scrapers	1-5
Dozers	1-5
Loaders	2-4
Dump Trucks	2-10
Small Tractors	1-3
Compactors	1-3
Graders	1-2
Water Trucks	1-3
Small Crane	1

Temporary construction areas will be needed to stage equipment, store material and transport material. Temporary construction areas will be located within locations already identified as permanent impacted areas such as excavation areas or areas within close proximity as depicted on the 100% Design Plans. Temporary construction activities outside permanent impact areas will be limited to temporary construction buffers, haul routes, material and equipment staging/stockpiling areas, and temporary egress/ingress areas adjoining City and County Roads

and as shown on the 100% Design Plans. Areas identified as temporary construction areas will be restored to pre-construction conditions once construction is complete. Temporary haul roads and other high traffic areas will be de-compacted and restored back to pre-construction soil densities. Restoration of temporary construction disturbance areas is specified in the final design drawings and specifications.

1.6.17 Temporary Haul Roads

The construction of temporary haul roads may be required to transport excavated materials from the channel corridor to City, County and State Roads depending upon the final re-use areas. Haul roads will also provide stable working and staging areas for excavation and loading activities. Haul road construction will depend on subgrade suitability, the size of the transport equipment to be used, the intensity of use, excavation/reuse locations, and identification of sensitive habitats and species. Temporary haul road construction could include proof-rolling native subgrade to provide a non-yielding surface or placement of crushed rock or river-run gravel over woven or non-woven geotextile fabric and a geo-grid material. Locations of anticipated temporary haul roads will be within the limits of temporary construction disturbance as depicted on the 100% Design Plans.

1.6.18 Construction Erosion and Sediment Control BMPs

Prior to Project construction, a Storm Water Pollution Prevention Plan (SWPPP) will be developed and approved by the North Coast Regional Water Quality Control Board (RWQCB) and implemented during construction. As part of the SWPPP, Best Management Practices (BMPs) for controlling soil erosion and the discharge of construction-related contaminants will be developed and monitored for successful implementation. Individual SWPPPs may be prepared for various construction components or phases (e.g., demolition of existing site structures, grading of one parcel, dredging channels, etc.). BMPs that will be implemented as part of the SWPPP will include:

- Cofferdams or other temporary fish barriers/water control structures will be placed in the channel during low tide, and will only be removed during low tide (if possible), after work is completed.
- Because cofferdams will be installed and the channel will be dewatered prior to excavation, equipment will not be operated directly within tidal waters or stream channels of flowing streams, after fish removal efforts have been completed.
- Silt fences and or silt curtains will be deployed in the vicinity of the cofferdams and at excavation of sloughs at culvert installation and removal areas to prevent any sediment from flowing into the creek or wetted channels. If the silt fences are not adequately containing sediment, construction activity will cease until remedial measures are implemented that prevent sediment from entering the waters below.

- Sediment sources will be controlled using fiber rolls, silt fences, sediment basins, and/or check dams that will be installed prior to or during grading activities and removed once the site has stabilized.
- Erosion control may include seeding, mulching, erosion control blankets, plastic coverings, and geotextiles that will be implemented after completion of construction activities.
- Excess water will be pumped into the surrounding fields to prevent sediment-laden water from entering the stream channel. If necessary, shallow basins will be excavated to hold the water to allow it to percolate into the soil rather than flow overland back to the stream channel.
- Appropriate energy dissipation devices will be utilized to reduce or prevent erosion at discharge end of dewatering activity.
- Turbidity monitoring will be conducted in Martin Slough throughout the site stabilization period to ensure that water quality is not being degraded. Turbid water will be contained and prevented from being transported in amounts that are deleterious to fish, or in amounts that could violate state pollution laws. Silt fences or water diversion structures will be used to contain sediment. If sediment is not being contained adequately, as determined by visual observation, the activity will cease until remedial steps are taken to correct the problem.
- Construction materials, debris, and waste will not be placed or stored where it can enter into or be washed by rainfall into waters of the U.S./State.
- Upland areas will be used for equipment refueling. If equipment must be washed, washing will occur where wash water cannot flow into wetlands or waters of the U.S./State.
- Operators of heavy equipment, vehicles, and construction work will be instructed to avoid sensitive habitat areas. To ensure construction occurs in the designated areas and does not impact environmentally sensitive areas, the boundaries of the work area will be fenced or marked with flagging.
- Equipment, when not in use, will be stored outside of the slough channel and above high tide elevations.
- All construction equipment will be maintained to prevent leaks of fuels, lubricants, or other fluids into the slough. Service and refueling procedures will not be conducted where there is potential for fuel spills to seep or wash into the slough.

- Extreme caution will be used when handling and/or storing chemicals and hazardous wastes (e.g., fuel and hydraulic fluid) near waterways, and any and all applicable laws and regulations will be followed. Appropriate materials will be on site to prevent and manage spills.
- All trash and waste items generated by construction or crew activities will be properly contained and removed from the project area.
- After work is completed, project staff will be on site to ensure that the area is re-contoured as per approved specifications. If necessary, restoration work (including revegetation and soil stabilization) will be performed in conformance with the Revegetation and SWPP plans.

1.6.19 Construction Dewatering and Stream Diversion Sequencing

During excavation within the channel, management of the stream flow from Martin Slough tributaries will be required through the construction period. Preventing inflow into the active work zones (both tidal and freshwater) will be required to prevent aquatic and non-aquatic organisms from entering the construction site, to reduce the water to be managed in the active work area, and to reduce moisture content in the excavated soils. Inflow control practices include placement of temporary coffer dams to isolate active work zone. The coffer dams may be comprised of native material, washed gravel encased with an impermeable geotextile, or visqueen liner in combination with ecology blocks, water bladders, and/or sheet piles. A combination of pumped and or gravity diversion pipes will be used to route flow around the active work areas. Fish screens will be installed immediately upstream from the coffer dams to prevent aquatic organisms from being transported into the bypass pipe.

Ponded storm or groundwater in construction areas will not be dewatered by project contractors directly into adjacent surface waters or to areas where they may flow to surface waters unless authorized by a permit from the North Coast RWQCB. In the absence of a discharge permit, ponded water (or other water removed for construction purposes), will be pumped into adjoining fields to infiltrate if suitable, or into baker tanks or other receptacles. If determined to be of suitable quality, some of this water may be used on-site for dust control purposes. The Contractor will be required to submit for review and approval by the Construction Manager a Dewatering and Creek Diversion Plan that shall include the proposed dewatering and diversion techniques and schedule of operations. The following construction phases and associated dewatering and diversions activities are proposed to occur in the order presented below.

Pond G: During the instream channel excavation a combination of pumped and/or gravity diversion pipes and or ditches will be used to route flow around the active work areas. Nuisance water (i.e., turbid water seeping into excavated areas from ground water) will be pumped to adjacent fields for infiltration or into settling basins. Clean water (e.g., water from Martin Slough and contributing tributaries) will be diverted using coffer dams that will prevent clean freshwater and clean tidal water from entering the excavation. Cofferdams will be placed in the Martin Slough channel immediately upstream and downstream from work sites, which will typically be 1,000 feet long or less. The coffer dams will preclude freshwater and tidal inflow into the work zone during construction. Diversion of freshwater from the upstream coffer dam will be pumped

or gravity piped through a temporary culvert that will discharge onto pastures or fairways where it will be allowed to infiltrate into the ground. If needed to prevent construction site water from returning directly to the stream through overland flow, shallow temporary holding basins may be excavated in the pasture or fairways.

Lower Martin Slough Channel (MS 0+00 to MS 46+00), Including Ponds C and D: Cofferdams will be placed at the upstream and downstream end of the restoration area. Diverted flow will be pumped, gravity piped, or ditched and conveyed downstream of the active work zone. Prior to placement of temporary coffer dams, a qualified biologist will utilize seines to corral fish out of the construction limits and into adjoining waters.

Upper Martin Slough Channel Including Pond E and F: Prior to placement of temporary coffer dams, a qualified biologist will utilize seines to corral fish to areas out of the construction limits and into adjoining waters, including Ponds C and D. Fish that cannot be corralled to areas outside of the construction limits will be captured and relocated.

1.6.20 Revegetation

The 100% Design Plans include the planting areas and species densities for the project area. The goal is to create native-forested riparian, wetland, and tidal marsh habitats along the Martin Slough channel and expanded ponds. The excavated reaches of Martin Slough and expanded ponds will be revegetated with low growing brackish and freshwater wetland (sedges and rushes) and riparian forest (Sitka spruce, willow, wax myrtle, and alder). Plant material, to the extent feasible, will be salvaged from the project impact footprint. All areas disturbed during grading and other construction activities will be treated with erosion control seeding with native grasses, forbs and shrubs. A combination of active planting and passive revegetation with invasive plant control will be used. Active planting will include re-seeding of pasture and golf course fairways, planting of trees and shrubs within the riparian zone as identified in the planting plan. Brackish wetlands will be re-vegetated with a combination of active planting and passive revegetation which will include monitoring and invasive plant removal. Exclusion fencing will be constructed around the perimeter of the riparian forest and along the channel through the pasture to protect the plantings. Fencing is not needed on the golf course (City) property as no cattle are allowed on the City property.

Active vegetation maintenance will be regularly performed to ensure that the target riparian forest habitat develops along the riparian corridor areas. Options for limiting undesirable vegetation include intermittent controlled flash grazing (cattle, goat, or sheep), manual removal, and mechanical removal. Special attention will be given to non-native invasive species such as dense-flowered cordgrass, and maintenance activities will be coordinated with regional eradication programs, including both timing and methods for removal of specific species. If grazing is employed, exclusion fencing will be placed to protect channel banks, newly establishing revegetation plantings, and areas of naturally recruiting desirable native plants. Flash grazing may be carefully employed to control weed cover in active planting areas and natural recruitment areas but will be managed to avoid excessive damage to native plantings and recruits.

2.0 REFERENCES

California Department of Fish and Game, Fish Passage Evaluations at Stream Crossings, 2001

National Oceanic Atmospheric Administration, NOAA. Guidelines for Salmonid Passage at Stream Crossings, 2001

Winzler & Kelly, Michael Love & Associates, Coastal Analysis. Martin Slough Enhancement Feasibility Study, 2006

Winzler & Kelly and Mike Love & Associates, Martin Slough Habitat Enhancement Project, 100% Design Submittal, December 2015

Winzler & Kelly and Mike Love & Associates, Martin Slough Habitat Enhancement Project, Basis of Design Report, September 2015

Winzler & Kelly, Martin Slough Wetlands Report. September 2011.

ATTACHMENT 4

Referral Agency Comments and Recommendation

Referral Agency	Response	Recommendation	Attached	On File
County Building Inspection Division	✓	Conditional Approval		✓
Department of Public Works	✓	Conditional Approval	✓	
Division of Environmental Health	✓	Approval		✓
Humboldt Community Services District	✓	Comment: proximity of lift station to work area		✓
Humboldt Bay Fire District	✓	Approval		✓
CA. Dept. of Fish and Game	✓	Conditional Approval		✓
Calfire	✓	Conditional Approval		✓
California Coastal Commission				
Blue Lake Rancheria	✓	Conditional Approval		✓
Wiyot Tribe	✓	Conditional Approval		✓
Bear River Band of the Rohnerville Rancheria	✓	Conditional Approval		✓
Army Corps of Engineers				
City of Eureka				
Farm Bureau				
State Lands Commission				
NOAA Fisheries				
US Fish and Wildlife Service				
Humboldt Bay Harbor Recreation and Conservation District				

ATTACHMENT 5

Initial Study and Mitigated Negative Declaration on CD