

Humboldt Bay National Wildlife Refuge
White Slough Tidal Wetlands Restoration Project
Final Initial Study and Mitigated Negative Declaration



White Slough Unit, South Humboldt Bay
Humboldt County, California

Humboldt Bay National Wildlife Refuge
White Slough Tidal Wetlands Restoration Project

White Slough Unit South Bay
Humboldt County, California

California Environmental Quality Act
Final
Initial Study and Mitigated Negative Declaration
State Clearinghouse #2015-02-2040

Prepared for:
California State Coastal Conservancy
1330 Broadway, 13th floor
Oakland, CA 94612
510-286-1015

March 10, 2015



Notice of Intent to Adopt Proposed Negative Declaration

Project Title: White Slough Restoration

Project Location: West of Highway 101 in the White Slough Unit of the Humboldt Bay National Wildlife Refuge, approximately one mile south of Fields Landing in Humboldt County, CA.

Lead Agency: California State Coastal Conservancy

Contact Person: Joel Gerwein

Document Type: CEQA - Mitigated Negative Declaration

Address where document may be obtained:

California State Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612

Humboldt County Library
1313 3rd St.
Eureka CA 95501

Project Description: The White Slough Restoration Project (Project) will restore tidal marsh habitat on diked former tidelands to enhance native wildlife habitat, protect existing transportation infrastructure and beneficially reuse sediment. The Project Area consists of diked former tidelands, primarily brackish marsh that is very low in species diversity. The Project Area is divided into the North Unit, West Unit and East Unit. The West Unit consists of approximately 40 acres of diked tidelands that has subsided and is currently approximately three feet below sea level. A portion of the dike protecting the Unit from tidal inundation failed on August 16, 2014. A temporary dam consisting of a heavy duty geotextile woven polypropylene tube filled with water (Aqua Dam) was installed in the breach. Other dike sections are severely eroded and expected to fail in the near future.

Tidal marsh will be restored in the West Unit by first raising surface elevations to levels that will support marsh vegetation, and then breaching the dike around the Unit. Surface elevations will be raised by placing up to 200,000 cubic yards of clean sediment. The initial phase will involve the placement of sediment to construct a tidal ridge dividing the project area into three drainage cells on the Refuge, as well as an additional cell on Caltrans right of way (ROW) which will largely remain at existing elevations. The tidal ridge will be at an elevation of approximately 9.0 ft, and will support brackish marsh vegetation. The drainage cells are referred to as the North Basin, Middle Basin, South Basin, and Caltrans Basin. Additional fill material will be placed and graded to create a complex mosaic of tidal marsh, with salinities ranging from salt to fresh. The tidal marsh will include a network of tidal channels and two depressional wetlands/ponds. The North, Middle, and South Basins will be completed in sequence. After all the fill is placed, portions of the levee will be lowered to suitable tidal marsh elevations. Material excavated from breach locations will be used for internal

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fill. Other portions of the levee will be left in place to create roosting areas and high-tide refugia for birds. The remaining tidegate and the temporary water-filled cofferdam will be removed. The levee will be fully breached in three locations to fully restore tidal inundation in each basin. The Caltrans basin will remain as a muted marsh, and a culvert with a fish-friendly flap gate will be installed to provide drainage into the South Basin. Chisum Creek, which currently drains to the bay via a ditch, will be rerouted south into the marsh through a constructed channel. This will create a larger mosaic of freshwater, brackish, and salt marsh habitats. A secondary but important purpose of the project is to create a "living shoreline" to protect the Highway 101 road prism from erosion by wave fetch and sea level rise.

The dike separating the North Unit from tidal influence is in relatively good condition, and the elevation of the North Unit is close to sea level, indicating that this area has not subsided significantly. Four existing tidegates in the North Unit will be modified to establish a muted tide cycle, and historic channels will be cleared of obstructions and sediment to improve drainage connectivity to support tidal and brackish water wetlands and avoid mosquito production.

Purpose of Notice: The purpose of this notice is to inform you that the California State Coastal Conservancy (Conservancy) is considering the adoption of a Mitigated Negative Declaration for this project. A hearing on the project is scheduled before the Conservancy Board of Directors on March 26, 2015 at 10:00 a.m. in the Napa County Transportation Planning Association Board Room, 625 Burnell Street, Napa, CA, at which time any and all interested persons may appear and address the Board concerning adoption of a Mitigated Negative Declaration for this project. Any updates to the meeting location and time will be posted on the Conservancy website (www.scc.ca.gov).

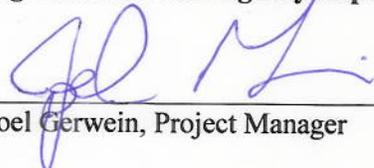
Public comments regarding the correctness, completeness, or adequacy of this Mitigated Negative Declaration are invited. Written comments should be received on or before the close of the 30-day public review period. Written comments should be addressed to the **California State Coastal Conservancy, Attn: Joel Gerwein, 1330 Broadway, 13th Floor, Oakland, CA 94612; fax: (510) 286-0470. Email: joel.gerwein@scc.ca.gov**

Public Review Period: Start Date: February 9, 2015

Ending Date: March 9, 2015

Responsible agencies sent a copy of this document: State Office of Planning & Research (State Clearinghouse), North Coast Unified Air Quality Management District, Caltrans, North Coast Regional Water Quality Control Board, California Department of Conservation, California Department of Fish & Wildlife, California Department of Parks and Recreation, County of Humboldt, Humboldt Bay Harbor, Recreation, and Conservation District, California Coastal Commission, Native American Heritage Commission, Office of Historic Preservation, California Natural Resources Agency, California State Lands Commission, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers.

Signature of Lead Agency Representative:



Joel Gerwein, Project Manager

Date: 2/6/15

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Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613
For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

SCH #

Project Title: White Slough Restoration

Lead Agency: California State Coastal Conservancy Contact Person: Joel Gerwein
Mailing Address: 1330 Broadway, 13th floor Phone: 510-286-4170
City: Oakland Zip: 94612 County: Alameda

Project Location: County: Humboldt City/Nearest Community: Fields Landing
Cross Streets: Highway 101 at Tompkins Hill Road Zip Code: 95537
Longitude/Latitude (degrees, minutes and seconds): 40 42 18.17 N / -124 12 39.78 W Total Acres: 56
Assessor's Parcel No.: 307-05-201, -203, -206, 307-04-201 Section: 29 Twp.: 4N Range: 1W Base: Humboldt
Within 2 Miles: State Hwy #: 101 Waterways: White Slough, Hookton Slough, Humboldt Bay
Airports: None Railways: NWP Schools: College of the Redwoods

Document Type:

CEQA: [] NOP [] Draft EIR NEPA: [] NOI Other: [] Joint Document
[] Early Cons [] Supplement/Subsequent EIR [] EA [] Final Document
[] Neg Dec (Prior SCH No.) [] Draft EIS [] Other:
[X] Mit Neg Dec Other:

Local Action Type:

[] General Plan Update [] Specific Plan [] Rezone [] Annexation
[] General Plan Amendment [] Master Plan [] Prezone [] Redevelopment
[] General Plan Element [] Planned Unit Development [] Use Permit [] Coastal Permit
[] Community Plan [] Site Plan [] Land Division (Subdivision, etc.) [X] Other: Consistency Det.

Development Type:

[] Residential: Units Acres
[] Office: Sq.ft. Acres Employees [] Transportation: Type
[] Commercial: Sq.ft. Acres Employees [] Mining: Mineral
[] Industrial: Sq.ft. Acres Employees [] Power: Type MW
[] Educational: [] Waste Treatment: Type MGD
[] Recreational: [] Hazardous Waste: Type
[] Water Facilities: Type MGD [X] Other: Tidal Marsh Restoration

Project Issues Discussed in Document:

[X] Aesthetic/Visual [] Fiscal [] Recreation/Parks [X] Vegetation
[X] Agricultural Land [X] Flood Plain/Flooding [] Schools/Universities [X] Water Quality
[X] Air Quality [] Forest Land/Fire Hazard [] Septic Systems [] Water Supply/Groundwater
[X] Archeological/Historical [X] Geologic/Seismic [] Sewer Capacity [X] Wetland/Riparian
[X] Biological Resources [] Minerals [] Soil Erosion/Compaction/Grading [] Growth Inducement
[X] Coastal Zone [X] Noise [] Solid Waste [X] Land Use
[] Drainage/Absorption [] Population/Housing Balance [X] Toxic/Hazardous [] Cumulative Effects
[] Economic/Jobs [] Public Services/Facilities [X] Traffic/Circulation [] Other:

Present Land Use/Zoning/General Plan Designation:

Agriculture Exclusive- 60 ac with combining zone overlays for Flood Hazard, Riparian Habitat, and Transitional Agriculture

Project Description: (please use a separate page if necessary)

The White Slough Restoration Project will restore tidal marsh habitat on subsided, diked former tidelands to enhance native wildlife habitat, protect existing transportation infrastructure and beneficially reuse sediment. Sea level rise and dike failure currently threaten to convert subsided marsh in this area to mudflat. Tidal marsh will be restored on ~40 ac by first raising surface elevations to levels that will support marsh vegetation, and then breaching the dike around the Unit. Surface elevations will be raised by placing up to 200,000 cubic yards of clean sediment. Four existing tidegates in the northern portion of the Project Area will be modified to establish a muted tide cycle.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Reviewing Agencies Checklist

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with an "X".
 If you have already sent your document to the agency please denote that with an "S".

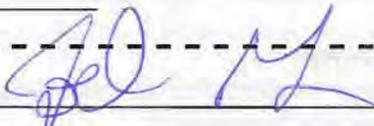
- | | |
|---|--|
| <input type="checkbox"/> Air Resources Board | <input checked="" type="checkbox"/> Office of Historic Preservation |
| <input type="checkbox"/> Boating & Waterways, Department of | <input type="checkbox"/> Office of Public School Construction |
| <input type="checkbox"/> California Emergency Management Agency | <input checked="" type="checkbox"/> Parks & Recreation, Department of |
| <input type="checkbox"/> California Highway Patrol | <input type="checkbox"/> Pesticide Regulation, Department of |
| <input checked="" type="checkbox"/> Caltrans District #1 | <input type="checkbox"/> Public Utilities Commission |
| <input type="checkbox"/> Caltrans Division of Aeronautics | <input checked="" type="checkbox"/> Regional WQCB #1 |
| <input type="checkbox"/> Caltrans Planning | <input checked="" type="checkbox"/> Resources Agency |
| <input type="checkbox"/> Central Valley Flood Protection Board | <input type="checkbox"/> Resources Recycling and Recovery, Department of |
| <input type="checkbox"/> Coachella Valley Mtns. Conservancy | <input type="checkbox"/> S.F. Bay Conservation & Development Comm. |
| <input checked="" type="checkbox"/> Coastal Commission | <input type="checkbox"/> San Gabriel & Lower L.A. Rivers & Mtns. Conservancy |
| <input type="checkbox"/> Colorado River Board | <input type="checkbox"/> San Joaquin River Conservancy |
| <input checked="" type="checkbox"/> Conservation, Department of | <input type="checkbox"/> Santa Monica Mtns. Conservancy |
| <input type="checkbox"/> Corrections, Department of | <input checked="" type="checkbox"/> State Lands Commission |
| <input type="checkbox"/> Delta Protection Commission | <input type="checkbox"/> SWRCB: Clean Water Grants |
| <input type="checkbox"/> Education, Department of | <input type="checkbox"/> SWRCB: Water Quality |
| <input type="checkbox"/> Energy Commission | <input type="checkbox"/> SWRCB: Water Rights |
| <input checked="" type="checkbox"/> Fish & Game Region #1 | <input type="checkbox"/> Tahoe Regional Planning Agency |
| <input type="checkbox"/> Food & Agriculture, Department of | <input type="checkbox"/> Toxic Substances Control, Department of |
| <input type="checkbox"/> Forestry and Fire Protection, Department of | <input type="checkbox"/> Water Resources, Department of |
| <input type="checkbox"/> General Services, Department of | <input checked="" type="checkbox"/> Other: <u>North Coast Unified Air Quality Management</u> |
| <input type="checkbox"/> Health Services, Department of | <input checked="" type="checkbox"/> Other: <u>Humboldt Bay Harbor District, USFWS, ACOE</u> |
| <input type="checkbox"/> Housing & Community Development | |
| <input checked="" type="checkbox"/> Native American Heritage Commission | |

Local Public Review Period (to be filled in by lead agency)

Starting Date 2/9/2015 Ending Date 3/9/2015

Lead Agency (Complete if applicable):

Consulting Firm: <u>Trinity Associates</u>	Applicant: <u>California State Coastal Conservancy</u>
Address: <u>980 7th Street, Suite K</u>	Address: <u>1330 Broadway, 13th floor</u>
City/State/Zip: <u>Arcata, CA 95521</u>	City/State/Zip: <u>Oakland, CA 94612</u>
Contact: <u>Aldaron Laird</u>	Phone: <u>510-286-4170</u>
Phone: <u>707-845-6877</u>	

Signature of Lead Agency Representative:  **Date:** 2/6/15

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

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Project Description and Initial Study

1. **Project title**

White Slough Tidal Wetlands Restoration

2. **Lead agency name and address**

California State Coastal Conservancy
1330 Broadway, 13th floor
Oakland, CA 94612

3. **Contact Persons and phone numbers**

Joel Gerwein, Project Manager
State Coastal Conservancy
1330 Broadway, 13th floor
Oakland, CA 94612
(510) 286-4170
joel.gerwein@scc.ca.gov

Aldaron Laird, Environmental Planner
Agent, Trinity Associates
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Arcata, CA 95521
(707) 845-6877
riverplanner@gmail.com

4. **Project location**

Latitude 40° 42' 12.8946" North, Longitude 124° 12' 42.3288", in the U.S.G.S. "Fields Landing" 7.5' quadrangle in Section 29 Township 4 North, Range 1 West, Humboldt Base Meridian, Cal Watershed 18010102.
Humboldt Bay National Wildlife Refuge (Refuge), White Slough Unit, Humboldt County, California (see Figure 1, Refuge Location Map).
Assessor Parcels: 307-05-201, 307-05-206, 307-08-107, 307-04-201, 307-05-203 (see Figure 2, Assessor Parcel Map).

5. **Project sponsor's name and address**

US Fish and Wildlife Service
Attn: Eric Nelson
Humboldt Bay National Wildlife Refuge
1020 Ranch Road
Loleta, CA 95551

6. **General plan designation**

Humboldt Bay Area Coastal Plan
Agricultural Exclusive (AE)

7. **Zoning**

Coastal Zone
AE 60 acre minimum
North Unit: A, T combining zone
East Unit: F, W, T, R combining zone
West Unit: W, D, F, R, T combining zone

FIGURE 1. Refuge White Slough Tidal Wetlands Restoration Project location map.



FIGURE 2. White Slough Tidal Wetlands Restoration Project assessor parcel numbers (Humboldt County GIS-2012 Aerial Photograph).

8. Description of the Project

The purpose of the White Slough Restoration Project (Project) is to restore and enhance salt marsh habitat on diked former tidelands and to enhance existing degraded brackish and freshwater wetlands to create additional native wildlife habitat, protect existing transportation infrastructure and beneficially reuse sediment. The project will further the Comprehensive Conservation Plan for the Humboldt Bay National Wildlife Refuge Complex by implementing the restoration discussed for the White Slough Unit, and by creating additional estuarine habitat in the Refuge. Project Designs at the 50% level are included as Appendix 1.

Salt marsh restoration at the White Slough Unit (WSU) of the Humboldt Bay National Wildlife Refuge (Refuge) would occur in an area that consists of diked former tidelands.

WSU includes approximately 61 acres of diked wetlands, consisting primarily of brackish marsh, as well as small areas of agricultural wetlands and freshwater marsh. Brackish marsh at the WSU is very low in species diversity, consisting of the native salt grass (*Distichlis spicata*), invasive sickle grass (*Parapholis strigosa*) and occasional non-native creeping saltbush (*Atriplex triangularis*). As part of a functioning salt marsh, where it occurs as a more diverse association, this brackish marsh vegetation would be of much higher value. Behind the dikes it forms a near monoculture of low wildlife value and biodiversity. For the purposes of this Project Description, the WSU will be described in terms of three subareas: North Unit (16 acres), West Unit (41 acres), and East Unit (4 acres) (Figure 3). The north and west subareas consist primarily of diked brackish marsh, while the east subarea consists of brackish marsh and freshwater wetlands located east of Highway 101. A portion of the dike protecting the west subarea from tidal inundation failed on August 16, 2014. A temporary dam consisting of a heavy duty geotextile woven polypropylene tube filled with water (Aqua Dam) was installed in the breach approximately one week later.

North Unit

The dike separating the North Unit from tidal influence is in relatively good condition, and the elevation of the North Unit is close to sea level, indicating that this area has not subsided significantly. Four existing tidegates in the North Unit will be modified to establish a muted tide cycle, and historic channels will be cleared of obstructions and sediment to improve drainage connectivity to support tidal and brackish water wetlands and avoid mosquito production.

West Unit

The dike separating West Unit from tidal influence is eroded and is overtopped at king tides. As noted above, a portion of the dike on the southern perimeter of the subarea failed in August 2014 and is currently patched with a water-filled cofferdam. Much of the vegetation within this subarea has died back due to the inundation that occurred when the dike breached. Two tidegates are present in the dike, one near the northwest corner and one near the southern boundary of the unit. The southern tidegate blew out when the dike failed in that area. The northern tidegate is currently leaking, resulting in brackish conditions within the dike. In addition to the existing temporarily repaired breach, water is currently seeping through the dike in at least one location. The USFWS installs sandbags on part of the dike during the winter to reduce seepage. The diked wetlands in West Unit have subsided such that their current elevation is approximately three feet lower than that of the salt marsh on the Bay side of the dikes. Unless the existing breach in the dike is repaired or the proposed project is carried out, the brackish marsh areas in West Unit will be converted to mudflats, and the Tompkins Hill Road-Highway 101 Interchange, which provides access to the College of the Redwoods, will be increasingly threatened with flooding. Chisum Creek drains into West Unit. It is currently channelized and flows parallel to the railroad tracks directly into Humboldt Bay.

Up to 240,000 cubic yards of clean silt-sand-clay soil will be placed in the West Unit. Several potential sources of fill material have been identified. The initial phase will involve the placement of fill to construct a tidal ridge to divide the project area into three drainage

cells on the Refuge, as well as an additional cell on Caltrans right of way (ROW) which will largely remain at existing elevations. The tidal ridge will be at an elevation of approximately 9.0 ft, and will support brackish marsh vegetation. The drainage cells will be referred to in the remainder of the document as the North Basin, Middle Basin, South Basin, and Caltrans Basin (Appendix 1). Additional fill material will be placed and graded to create a complex mosaic of tidal marsh, with salinities ranging from salt to fresh. The tidal marsh will include a network of tidal channels and two depressional wetlands/ponds. The North, Middle, and South Basins will be completed in sequence. After all the fill is placed, portions of the levee will be lowered to suitable tidal marsh elevations. Material excavated from breach locations will be used for internal fill. Other portions of the levee will be left in place to create roosting areas and high-tide refugia for birds. The remaining tidegate and the temporary water-filled cofferdam will be removed. The levee will be fully breached in three locations to fully restore tidal inundation in each basin. The Caltrans basin will remain as a muted marsh, and a culvert with a fish-friendly flap gate will be installed to provide drainage into the South Basin. Fill will be placed in the northern portion of the Caltrans basin to extend the brackish marsh on the tidal ridge to meet the slope of the Highway 101 embankment. Chisum Creek will be rerouted south into the marsh through a constructed channel. This will create a larger mosaic of freshwater, brackish, and salt marsh habitats. A secondary but important purpose of the project is to create a “living shoreline” to protect the Highway 101 road prism from erosion by wave fetch and sea level rise.

Construction activities would be scheduled between July 1st and October 31st to avoid periods of greatest precipitation, and potential amphibian and bird breeding. Placement and grading of fill is anticipated to occur over two or three construction seasons (April-October) due to the large amount of imported fill required for the project. The construction area will be stabilized over the intervening winter using best management practices.

The proposed project takes into consideration impacts of relative sea level rise (SLR) (6mm/yr) on intertidal wetlands by providing surface elevations that will enable salt marsh to persist with approximately two or more feet of sea level rise. The proposed project will initially restore salt marsh habitat on a gradient that would culminate in upland-Riparian habitat. By 2050, with projected relative SLR rates, the area would transition to a mix of mud flats, tidal marsh, and upland-Riparian. By 2080, the area would likely support a mixture of mud flats and tidal marsh. The project design was developed by the US Fish and Wildlife Service (USFWS) Coastal Program and the Refuge.

Proposed Actions:

West Unit:

1. Develop construction site access via an undeveloped driveway from a County Road/U.S. 101 south bound on/off-ramp beneath Highway 101 overpass. Install temporary traffic advisory signage on the U.S. 101 off ramps. Build a stabilized construction entrance/exit pad. Two temporary crossings of remnant tidal slough channels will be constructed.

2. Construct three earthen tidal ridges to divide the project area into four basins. Tidal Ridge 1 will run along the eastern boundary of West WSU, Tidal Ridge 2 will extend from Tidal Ridge 1 to the west to separate the Middle and South Basins, and Tidal Ridge 3 will separate the North and Middle Basins (Appendix 1). The tidal ridges will have a top width of 20-feet and range in elevation between 8.5 feet and 9.0 feet NAVD 1988. The tidal ridges will be used as construction access roads. Tidal ridges will be graded and stabilized as needed to maintain equipment access during construction. A culvert with a fish-friendly flap gate will be installed to provide drainage from the Caltrans Basin into the South Basin. Approximately 1,200 ft on the northern end of Tidal Ridge 1 may be extended to the east to meet the 9' contour on the Highway 101 embankment.
3. A 20-foot setback gradient will be established around the perimeter of all existing open water channels and around proposed brackish water submergent and emergent wetlands areas. Several sections of old farm ditches that are currently wet will be filled. These ditches are remnant features that were excavated to provide drainage when the project area was in agricultural use.
4. The North, Middle, and South Basins will be further subdivided temporarily into areas of approximately 20,000 square feet (~0.5 acre) or less. Fill areas will be scraped if necessary, filled and graded in sequence, as described below. Up to 40 acres of brackish marsh and seasonal freshwater wetlands will receive fill to restore tidal wetland elevations.
5. The remaining fill placement will be limited to a single basin at a time. If the marsh plain is flooded due to levee leakage, the basin under construction will be isolated from the adjacent drainage cells and dewatering will occur to remove water from the marsh plain surface during construction. Dewatering will require placement of seine nets to block fish and placement of a pump intake line into wetted channels. Water will be discharged onto land into an adjacent (inactive) drainage cell.
6. Fill areas may be first scraped to depth of 6 inches if thick vegetation is present and ground conditions allow. Top soil and vegetation will be reserved.
7. Fill will be off-loaded, placed and graded to design elevations in each fill area.
8. Steps 6 and 7 will be repeated until all fill areas are complete. Access roads will be removed as work is completed. Removal consists of disking road surfaces and loosening the top six inches of soil. Reserved top soil and vegetation will be spread.
9. Construct a stream channel to connect Chisum Creek to brackish water wetlands.
10. Excavate three breaches in the perimeter dike. There will be one levee breach in each of the North, Middle, and South Basins. The breaches will be excavated to MLLW and have a bottom width of 10-15 feet, with 2:1 side slopes. Breaches may adjust over time through tidal action. Spread excavated material within fill areas.

11. Remove temporary cofferdam and existing tide gate and breach perimeter dike in three locations. Spread excavated material within fill areas.
12. Reroute discharge from Chisum Creek from inboard ditch into newly constructed creek channel flowing through tidal wetlands complex to Humboldt Bay.
13. Demobilize equipment and remove all construction materials from site.

North Unit:

1. Remove top-hinged tide gates from one 40 inch and one 20 inch culvert.
2. Remove debris that has accumulated and buried a 36 inch box culvert and 36 inch culvert to restore tidal inundation.

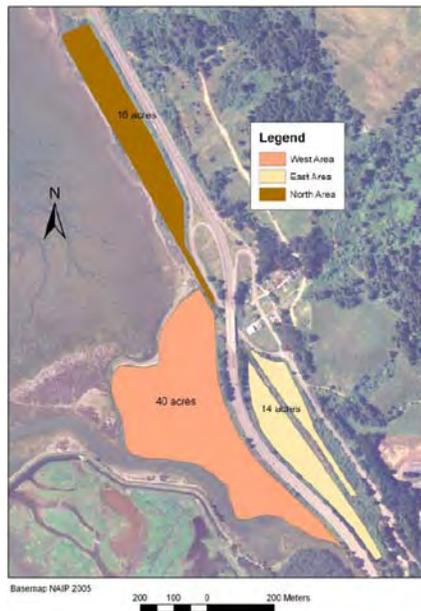


FIGURE 3. White Slough Tidal Wetlands Restoration Project areas (2005 Aerial Photograph).

9. Surrounding land uses and setting

Land Use

Property bordering the Project Area to the north along the Bay shoreline is open space owned by the Humboldt Bay Harbor, Recreation and Conservation District (Harbor District). The North Coast Railroad Authority property forms the Western border of North Unit and the Northern Border of West Unit. Property to the west of the Project Area is mudflat, open water, or tidal marsh that is either part of the Refuge or public trust lands managed by the Harbor District for open space. A major public transportation corridor, Highway 101, is located east of the North Unit, and runs between the West and East Units. North and east of East Unit is Tompkins Hill Road and private property that consists of a small forested area, agricultural grazing land, and residential use. The College of the Redwoods Humboldt Bay campus is located south and east of East Unit.

Environmental Setting

The Refuge is located within the Pacific Flyway and provides important habitat as a key migratory stopover and/or wintering area for several species of waterfowl and shorebirds. Salmon Creek is the only sizeable perennial stream that flows into South Bay and it supports several anadromous and pelagic fish species.

The Project area resides on diked former tidelands that were converted from salt marsh to pasture in the first half of the 20th century, most likely between 1932 and 1949 (see Figure 4). White Slough, at the south end of the Project Area remains open to full tidal influence.

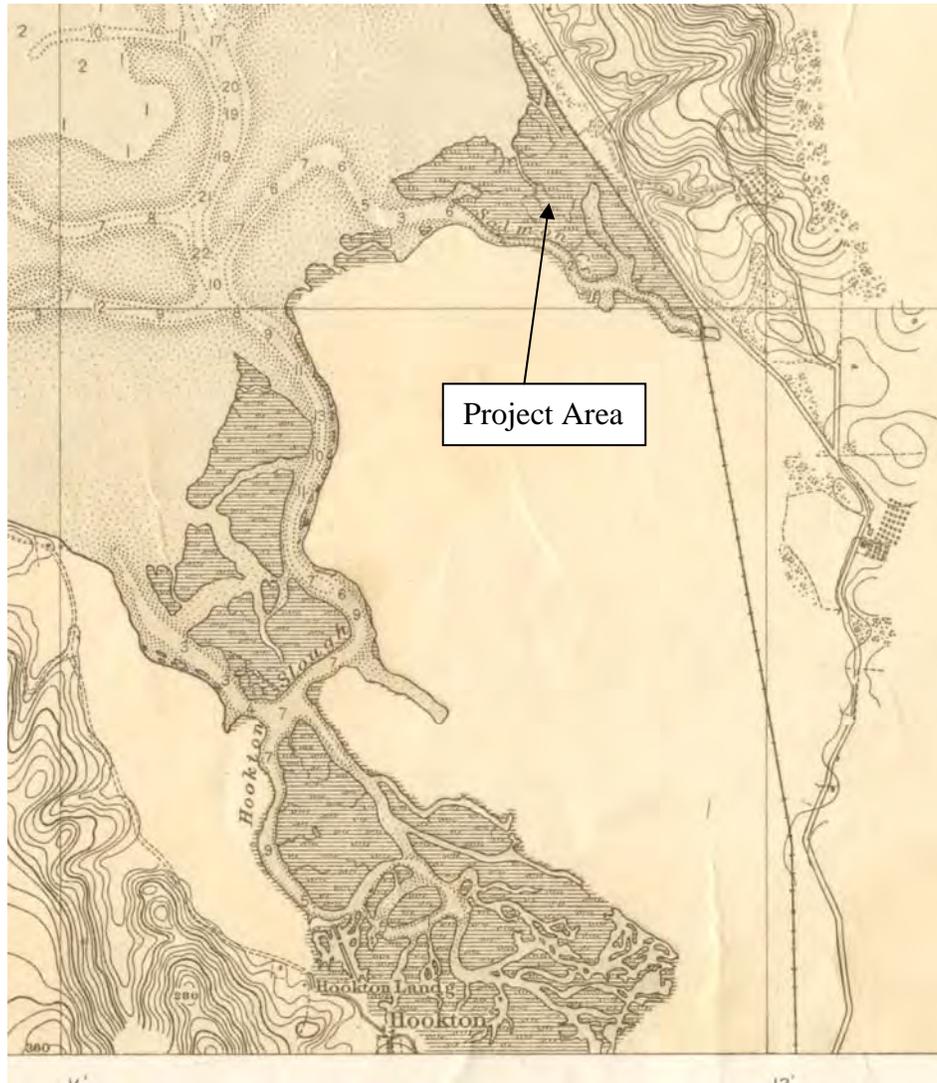


Figure 4. US Coast & Geodetic Survey of Salmon Creek, White Slough, and Hookton Units (1932 USCGS Sheet #5832). Stippled areas indicate salt marsh as depicted in this map.

Nearly the entire Project Area, except for the dikes, floods seasonally during periods of heavy precipitation in the winter and spring. The annual King Tides nearly overtop this dike.

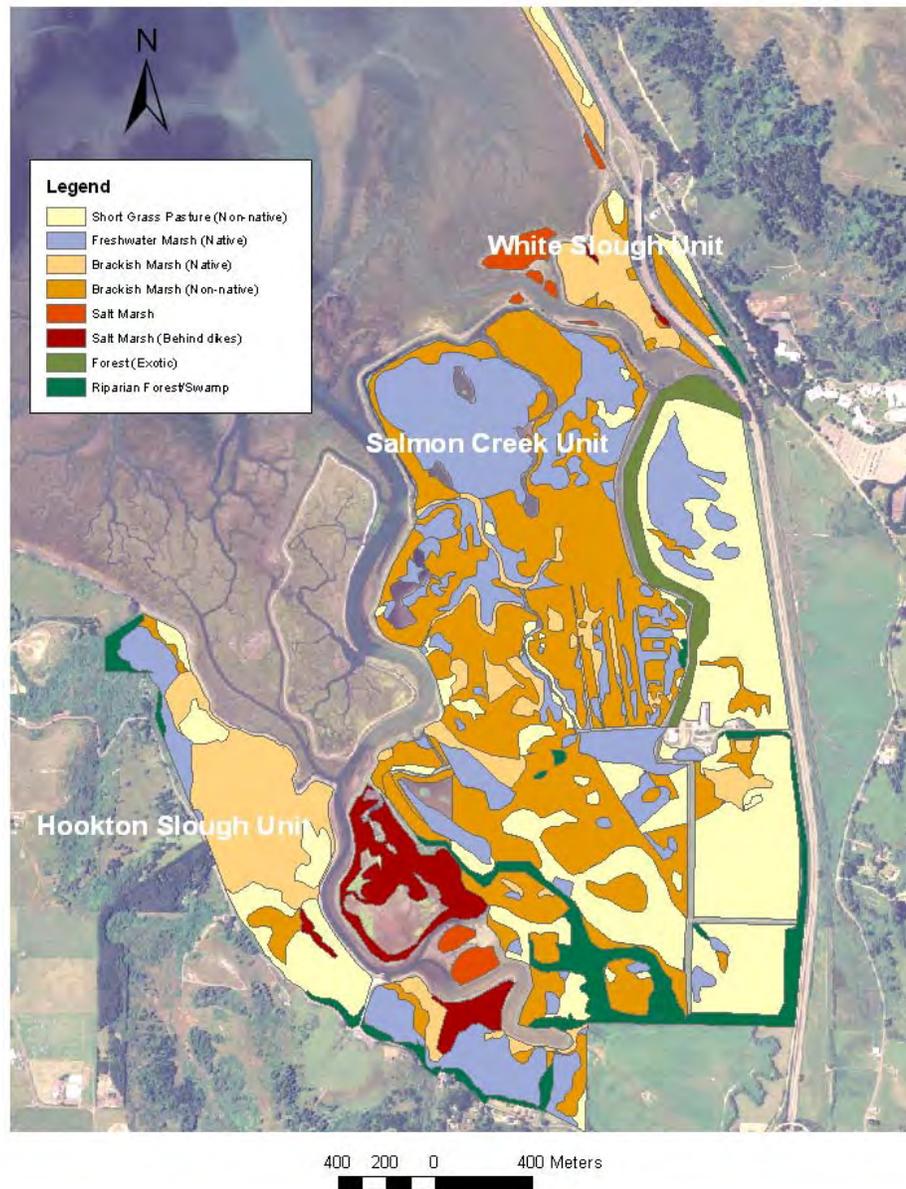


Figure 5. Terrestrial vegetation of White Slough, Salmon Creek and Hookton Slough Units (2009 USFWS)

Presence of Special Status Habitats

The following special status or protected habitats occur in the White Slough Unit:

- Navigable or tidal waters, like White Slough, are protected by the Rivers and Harbor Act.
- Waters of the U.S. are jurisdictional wetlands protected by the Clean Water Act.
- Critical Habitat (tidewater goby) designated and protected pursuant to the federal

Endangered Species Act.

- FEMA 100 year flood zone protected by Executive Order No.11988.
- Waters of the State protected by the Porter-Cologne Act.
- Freshwater streams and tidal channels with freshwater inflow are protected by California Department of Fish and Wildlife (DFW) Streambed Alteration Program.
- Coastal wetlands defined and protected by the California Coastal Act.
- Tidelands and former tidelands are sovereign lands protected by the Coastal Act and Public Trust Doctrine.

Presence of Special Status Species:

Special status species are legally protected pursuant to the California Environmental Quality Act (CEQA) Section 15380, and include species protected under California and federal Endangered Species Acts, and California’s “Fully Protected Species” statutes (Fish and Game Code Sections 3503.5, 3505, 3511, 4700, 5050, and 5515). Pursuant to Fish and Game Code Sections 3503.5 and 3505 birds of the Orders Falconiformes and Strigiformes and egrets (here designated as birds in the family Ardeidae) are, in effect, fully protected since “take” (capture or kill) is unlawful and cannot be authorized by the state. The species list assembled for the White Slough Unit includes species that are likely to be present. This list has been developed from online databases maintained by the DFW and USFWS for the U.S. Geologic Survey “Fields Landing” quadrangle and adjacent quadrangles (see Appendix 2), from DFW’s 2011 List of Special Animals and 2014 List of Special Plants, and from the Refuge’s 2009 Comprehensive Conservation Plan (CCP) (USFWS 2009).

Status Codes

FE = Federal Endangered, FT = Federal Threatened, FC = Federal Candidate, and CH = Critical Habitat, SE = State Endangered, ST = State Threatened, SSC = Species of Special Concern, and SFP = State Fully Protected.

Plants

- Sea-watch (*Angelica lucida*)
- Lyngbye’s sedge (*Carex lyngbei*) (SSC)

Amphibians

- Northern red-legged frog (*Rana aurora aurora*) (SSC)

Fish

- Tidewater goby (*Eucyclogobius newberryi*) (FE)

Birds

Birds in the orders *Falconiformes* or *Strigiformes*

- Northern harrier (*Circus cyaneus*) (SSC),
- Sharp-shinned hawk (*Accipiter striatus*),
- Cooper’s hawk (*A. cooperii*)
- Red-shouldered hawk (*Buteo lineatus*),
- Red-tailed hawk (*B. jamaicensis*),

- Osprey (*Pandion haliaetus*)
- Bald eagle (*Haliaeetus leucocephalus*) (SE)(SFP)
- Merlin (*Falco columbarius*)
- American kestrel (*F. sparveius*),
- Peregrine falcon (*F. peregrinus*) (SFP)
- Barn owl (*Tyto alba*)
- Burrowing owl (*Athene cunicularia*)(SCC)
- Long-eared owl (*Asio otus*) (SSC),
- Short-eared owl (*A. flammeus*)(SSC),
- Great Horned owl (*Bubo virginianus*),

Birds in the family Ardeidae

- Great blue heron (*Ardea herodias*)
- Cattle egret (*Bubulcus ibis*),
- Green heron (*Butorides virescens*)
- Black-crowned night-heron (*Nycticorax nycticorax*),
- Great egret (*Ardea alba*) (FP),
- Snowy egret (*Egretta thula*) (FP),
- American bittern (*Botaurus lentiginosus*) (FP),

Other bird species

- Long-billed curlew (*Numenius americanus*)
- Double-crested cormorant (*Phalacrocorax auritus*)

10. **Other public agencies whose approval is required**

Federal

- Pursuant to Section 404 of the Clean Water Act the Refuge will apply for an Individual Permit to the United States Army Corps of Engineers (ACE) District Engineer for its proposed White Slough Tidal Wetlands Restoration Project activities.
- The Refuge will request a concurrence letter from the National Marine Fisheries Service (NMFS) that the Refuge's determination that its White Slough Tidal Wetlands Restoration Project is not likely to adversely affect listed species or their critically designated habitat pursuant to Section 7 of the federal ESA and Section 305 of the Magnuson-Stevens Fishery Management Act (MSA).
- The Refuge will request concurrence from the USFWS that the Refuge's determination that the White Slough Tidal Wetlands Restoration Project is not likely to adversely affect listed species or their critically designated habitat pursuant to Section 7 of the federal ESA.
- The Refuge will consult with the three Wiyot area Tribes and the State Historic Preservation Officer under Section 106 of the National Historic Preservation Act.

State

- The Refuge will apply for a Water Quality Certification (WDID No. 1B10009WNHU) pursuant to Section 401 of the Clean Water Act, which is administered by the North Coast Regional Water Quality Control Board (NCRWQCB).
- The Refuge will submit a request to the NCRWQCB for a waiver of Notice of Intent to secure a General Permit to discharge storm water associated with construction activities from the California's State Water Resources Control Board for discharges associated with construction activities.
- The Refuge will request a concurrence letter from the California Coastal Commission's Federal Consistency Division. The letter confirms the Refuge's Consistency Determination that its White Slough Tidal Wetlands Restoration Project is not likely to adversely affect coastal resources pursuant to Section 307 of the Coastal Zone Management Act.
- The Refuge will request a Streambed Alteration Agreement from the DFW, for its activities that will affect Chisum Creek.

Local

- The Refuge will request a Development Permit from the Humboldt Bay Harbor,

Recreation, and Conservation District for the modification of dikes and removal and modification of tide gates.

11. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

To streamline the following impact analysis the proposed Project actions have been combined:

1. Timing
2. Access
3. Dewatering- Stream Relocation- Diversions
4. Stream Crossing
5. Excavation-Grading
6. Placing Fill-Grading
7. Planting
8. Removal of tide gate and temporary coffer dam
9. Lowering dike elevations
10. Maintenance

The environmental factors checked below would be potentially affected by the proposed Project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

	Aesthetics		Agriculture Resources		Air Quality
X	Biological Resources		Cultural Resources		Geology /Soils
X	Hazards & Hazardous Materials	X	Hydrology / Water Quality		Land Use / Planning
	Mineral Resources	X	Noise		Population / Housing
	Public Services		Recreation		Transportation/Traffic
	Utilities / Service Systems	X	Mandatory Findings of Significance		

DETERMINATION:

On the basis of this initial evaluation:

- I find that the proposed Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- I find that although the proposed Project COULD have a significant effect on the environment, there will not be a significant effect in this case because revisions in the Project have been made by or agreed to by the Project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- I find that the proposed Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- I find that the proposed Project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed Project COULD have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed Project, nothing further is required.

Samuel Schuchat, Executive Officer

Date

Initial Study Checklist

I. AESTHETICS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Have a substantial adverse effect on a scenic vista?			X	
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?				X
c) Substantially degrade the existing visual character or quality of the site and its surroundings?			X	
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?				X

Aesthetics

a) Have a substantial adverse effect on a scenic vista?

Threshold of Significance: Long-term intrusion or alteration of a scenic vista that is visible to the public.

Assessment: The Project will have a short-term impact that is less than significant on scenic resources visible to the public.

- The Project area is visible from Highway 101 and Tompkins Hill Road. During construction, there will be a short term adverse impact, as the current view of brackish marsh will be replaced with unvegetated sediment and construction machinery. However, construction will be phased, with vegetation removal, filling and grading occurring in one 20,000 ft² area at a time. In addition, the current view has been degraded due to the dieback of brackish marsh vegetation after the dike breach. The Project Area is expected to revegetate within 1-2 years of project construction. The wetland mosaic that will be restored to the Project Area will present a more attractive vista than the current one.
- Project activities, plantings, and structures will not obstruct the public's view of any scenic vista such as of Humboldt Bay to the west of Highway 101.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway?

Threshold of Significance for this initial study: Permanent adverse change within a State scenic highway to scenic resources' physical, vegetative, or aesthetic elements visible to the public.

Assessment: The Project will have no impact it is not located in a state scenic highway protection corridor.

- Caltrans' online California Scenic Highway Mapping System http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm was consulted.
- Highway 101 is eligible for designation as a State Scenic Highway, but Humboldt County has not applied to Caltrans for scenic highway approval.
- The Project's construction activities during July through October will be visible to the public from Highway 101 and Tompkins Hill Road.
- To the extent that construction activities may impair the public's view of Humboldt Bay and the WSU's scenic resources the duration of the Project's construction activities will be relatively short, from July through October over the course of two years. As stated above, construction will be phased, such that aesthetic impacts will be limited to a relatively small area at any given time.
- Project activities, plantings, and structures will not obstruct the public's view of any scenic vista such as of Humboldt Bay to the west of Highway 101.
- Ultimately, the Project Area will present an equally attractive vista to the current vista.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Threshold of Significance for this initial study: Long-term alteration or degradation of the existing visible character and quality of a site and its surroundings, which is visible to the public.

Assessment: The Project's short-term effects will have a less than significant adverse impact on the visible character and quality of the Project site and its surroundings, which are visible to the public.

- Refer to assessments in 1 a) and b) above.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Threshold of Significance for this initial study: Long-term or permanent development that would create a new source of substantial light or glare.

Assessment: The Project will have no impact, as it will not create a new source of lighting or glare.

- The proposed Project does not involve the use of any lights or construction of any structures that would create a new source of substantial light or glare.

II. AGRICULTURE RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X

Agricultural Resources

a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Threshold of Significance for this initial study: Physical changes that prevent the use of prime farmland, unique farmland, or farmland of statewide importance.

Assessment: The project will have no impact. There is no prime farmland, unique farmland, or farmland of statewide importance on or adjacent to the Project area.

The Project Area is currently managed for open space and fish and wildlife habitat, and consists primarily of brackish marsh/mudflat, with 3.3 acres of freshwater marsh in East Unit, and 2.4 acres of seasonally wet grassland in the northeast corner of West Unit. The seasonally wet grassland is dominated by Italian ryegrass (*Lolium multiflorum*) and velvet grass (*Holcus lanatus*). None of the Project Area has been used for agricultural production for the last 26 years. West Unit is currently unusable for agriculture, due to its dominance by brackish marsh vegetation and frequent inundation during the winter months due to leaky tidegates and overtopping of the dikes during high tides.

Prime Farmland:

The potential for prime farmland to occur in the project area was evaluated using the definition in the 1983 Humboldt County General Plan (HCGP). The HCGP defines prime agricultural land as follows, per California Government Code Section 51201(c):

- A. Land which qualifies for rating as Class I or Class II in the Soil Conservation Service land use capability classifications.
 - B. Land which qualifies for rating 80 through 100 in the Storie Index Rating. (Res. 85-55, 5/7/85)
 - C. Land that has a livestock carrying capacity of one animal unit per acre.
 - D. Land planted with fruit or nut bearing trees, vines, bushes or crops which have a non-bearing period of less than five years and which will normally provide a return adequate for economically viable operations during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production.
 - E. Land capable of producing an unprocessed plant production adequate for economically viable operations.
 - F. Additional lands adjacent to those above which presently or historically have been necessary to provide for economically viable agricultural areas. These lands are included to prevent the establishment of incompatible land uses within an area defined by natural or man-made boundaries.
- The Natural Resources Conservation Service (NRCS) soil mapping is not currently available for the Project Area. Therefore, it is not possible to determine whether soils in the Project Area are prime soils according to Criteria A. However, NRCS indicated that it would not designate an area as a prime agricultural land unless it is currently irrigated or has a history of irrigation (J. Komar, pers. comm.) This criterion also applies to Farmlands of statewide importance, which must have been used for the production of irrigated crops; the Project area is not irrigated and was historically used only for pasture. The Farmland Mapping and Monitoring Program of the California Resources Agency, does not yet cover Humboldt County¹.
 - According to information provided by Humboldt County, based on Soils of Western Humboldt County, California (McLaughlin and Harradine 1965), the project site contains Bayside silty clay loam 2 (Ba2, poorly drained) and 3 (Ba3, imperfectly drained) soils with 0-3% slopes. The Ba2 soils have a Storie Index rating of 36, and Ba3 soils have a Storie Index rating of 49. Prime agricultural land requires a Storie Index Rating of 80-100. Thus, the project area does not qualify as prime agricultural land by criteria B.
 - The third potential qualifying definition of prime agricultural land – the ability to support livestock used for the production of food and fiber with an annual carrying capacity equivalent to at least one animal-unit per acre as defined by the United States Department of Agriculture – similarly does not apply to the project site. The Project Area is dominated by brackish marsh vegetation with little or no forage value, and thus does not have a livestock carrying capacity of one animal

¹ (http://www.consrv.ca.gov/DLRP/fmmp/overview/survey_area_map.htm)

- unit per acre. Therefore, the Project Area does not qualify as prime agricultural land according to Criteria C.
- The Project Area is not planted with crops. Due to the salinity in the soil indicated by the brackish marsh vegetation currently present at the site, it is not capable of producing an unprocessed plant production adequate for economically viable operations. It is not necessary to provide for an economically viable agricultural area, as it is not currently in agricultural production. Therefore, the project does not satisfy Criteria D, E, or F.

7.9 acres of prime agricultural land are mapped within the Project Area by Humboldt County. This area is mapped as Bayside silty clay loam, imperfectly drained, 0 to 3 percent slope, and has a Storie Index Rating of 49. When these soils were mapped in the early 1960s, this area of mapped prime agricultural land was assigned a capability class of II-w2, meaning that the land has moderate agricultural limitations in terms of agricultural production because of problems with excess water. The remainder of the project area is mapped as Ba2, IIIw2, Storie Index Rating 36. Based on the significant compaction and subsidence of the Project Area, which is now approximately three feet below MHT, and based on the brackish marsh vegetation present on the majority of the site, including the area mapped as prime agricultural land, the County's prime agricultural layer appears to reflect outdated information in the Project Area. It is our conclusion, based on the analysis above, that the project area does not contain prime farmland.

b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Threshold of Significance for this initial study: Implement land uses that are not allowed in agricultural zone districts, or on lands under Williamson Act contract.

Assessment: The project will have no impact as it is located on land zoned Agricultural Exclusive 60 acre minimum with Floodplain and Transitional Agricultural combining zones. The project does not conflict with existing zoning for agricultural use. The project is not located on land under a Williamson Act contract.

- The Refuge is federal property and is not subject to local land use zoning.
- There is no Williamson Act contract for the property in the Project area.
- The County has zoned the proposed Project area AE-60 acre minimum with combining zone overlays for Flood Hazard, Riparian Habitat, and Transitional Agriculture.
- Aquatic habitat restoration for fish and wildlife management is an allowable use of AE zoned lands, therefore the proposed actions do not conflict with County's zoning for agriculture use.

c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use?

Threshold of Significance for this initial study: Physical changes to a significant acreage of existing farmland that preclude the continued use of that property for agriculture uses and threaten agricultural viability of the parcel.

Assessment: The Project will have no impact on the continued use of property for agricultural uses and will not convert farmland to non-agricultural uses.

- Prior to 1988, when USFWS acquired this property, some of the Project area was used seasonally as pasture for grazing livestock and hay production.
- As described previously, soils in the project site have subsided and compacted with the oxidation of organic material in the former tidelands. The area is now approximately 3 feet lower than the salt marsh on the outside of dikes. The project area is now only capable of supporting wetlands not agricultural uses.

III. AIR QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?				X
b) Violate any air quality standard or contribute substantially to an existing or Projected air quality violation?				X
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				X
d) Expose sensitive receptors to substantial pollutant concentrations?				X
e) Create objectionable odors affecting a substantial number of people?				X

Air Quality

a) Conflict with or obstruct implementation of the applicable air quality plan?

Threshold of Significance for this initial study: Project generates pollutants that would prevent attainment of the North Coast Unified Air Quality Management District’s (NCUAQMD) long-term air quality objectives.

Assessment: The Project will have no impact on the implementation of the NCUAQMD air quality plan.

- The Project’s construction activities are of limited scope and duration and do not involve any stationary sources of pollutants.
- During construction the operation of vehicles and equipment as well as excavation and grading activities will generate pollutants in the short-term such as fugitive dust (particulate matter less than 10 microns [PM10]).

- While the short-term operation of vehicles and diesel powered construction equipment does release PM 10 and nitrogen oxides (NOx) pollutants, these releases are not expected to result in a substantial adverse effect as all equipment will be equipped with state approved exhaust systems, maintained in good working order.
- Fugitive dust, less than PM 10, associated with the newly graded 40 acre salt marsh restoration area will be generated for a limited time but will only affect a localized area during Project activities until tide water inundation is restored. Mulching and seeding with grass is normally used to minimize the generation of dust. However, this method is not considered viable in tidally inundated areas.
- Clearing of vegetation for excavation and grading will generate debris, which will be disposed of by composting onsite.
- While the NCUAQMD does not require a permit for excavation and grading activities, the Refuge will coordinate with the NCUAQMD before conducting any prescriptive burning of vegetative debris.
- Sediment will need to be transported to the site to restore tidal elevations to West Unit. Sources of sediment have not been determined at this time. Potential sources include the Martin Slough Enhancement Project, the Salt River Ecosystem Restoration Project, and dredge materials from sources such as Fisherman's Canal in King Salmon, the Woodley Island Marina, or the Eureka Marina. Because sediment sources have not been determined, and because the disposition of sediment is an integral part of the projects which will generate it, air quality impacts associated with delivery of sediment were analyzed based on a worst case assumption that 240,000 cy of sediment would be imported using 20 yard trucks. Each of the 12,000 truck trips was assumed to be 20 miles round trip.
- Potential impacts to air quality and greenhouse gas (GHG) emissions were analyzed utilizing the California Emissions Estimator Model (CalEEMod) Version 2013.2 (www.CalEEMod.com). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state, to quantify criteria pollutant and GHG emissions associated with the construction and operational activities from a variety of land use projects. The program was designed in part for use in analyzing air quality and GHG impacts in CEQA documents. Project emissions are summarized in Table AQ-1 below.

Table AQ-1. Estimated Emissions from Construction of the Salt River Restoration Project. Figures were calculated using CalEEMod, version 2013.2. See Appendix 3 for detailed model assumptions and results.

	ROG	NO _x	CO	SO ₂	PM10	PM2.5	CO _{2-ecq}
	Tons/yr						MT/yr
2015 Unmitigated Emissions	0.58	5.24	5.05	0.06	1.18	0.71	518.08
2016 Unmitigated Emissions	0.40	3.49	3.65	0.05	0.39	0.25	426.93
NCUAQMD Annual Threshold	40	40	100	No threshold	16	No threshold	No threshold
Significant Impact?	No	No	No	No	No	No	No*

*As discussed below in Greenhouse Gases, the project is expected to be carbon neutral or a long-term carbon sink due to carbon sequestration anticipated in restored salt marsh and other wetlands. Therefore, a specific threshold for short-term CO₂ emissions for the project is unnecessary.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Threshold of Significance for this initial study: Release of pollutants that violate an air quality standard, or substantially contribute to an existing air quality violation.

Assessment: The Project will have no impact on any air quality standard.

- While the short-term operation of vehicles and diesel powered construction equipment does release PM 10 and NO_x pollutants, these releases are not expected to result in a substantial adverse effect as all equipment will be equipped with state approved exhaust systems, maintained in good working order.
- Fugitive dust, less than PM 10, will be generated for a limited time but will only affect a localized rural area during Project activities and until the newly disturbed salt marsh restoration area becomes saturated or vegetated.
- There are no existing air quality violations in the Project area.

c) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Threshold of Significance for this initial study: Production of pollutants by the Project that would result in a cumulatively considerable net increase in pollutants for which the North Coast Air Basin's is in non-attainment.

Assessment: The Project will have no impact, and will not result in a cumulative increase in any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard.

d) Expose sensitive receptors to substantial pollutant concentrations?

Threshold of Significance for this initial study: The Project would result in a substantial increase of pollutants that are capable of reaching sensitive receptors.

Assessment: The Project will have no impact on sensitive receptors.

- There are no sensitive receptors such as populated areas, health care facilities, convalescent centers, retirement homes, residences, schools, child care centers, recreational facilities in the immediate vicinity of the Project. The closest sensitive residences to the project area are three residences located between 500 ft and 750 ft from the Project Area, and the College of the Redwoods campus, whose buildings range in distance from the project area from 750-3,500 ft.

e) Create objectionable odors affecting a substantial number of people?

Threshold of Significance for this initial study: The Project would result in a substantial increase of objectionable odors that are capable of reaching substantial number of people.

Assessment: The Project will have no impact on a substantial number of people as a result of increasing objectionable odors.

- There are not a large number of people living in the vicinity of, or that have access to, the Project area.
- Humboldt Bay and its tidal and non-tidal wetlands, as well as the wetlands on the Refuge can generate objectionable odors associated with decaying organic matter from time to time, but only as a result of natural decomposition. These odors are generated by the existing brackish marsh and are not expected to worsen during or after project construction.

IV. BIOLOGICAL RESOURCES

Would the Project:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?			X	
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan,				X

or other approved local, regional, or State habitat conservation plan?

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by DFW, NOAA, or USFWS?

Threshold of Significance for this initial study: Direct impacts on individuals of any protected species or species of concern or substantial indirect impacts that adversely affect habitat functions (physical, chemical and biological processes that characterize that habitat) or values.

Assessment: This Project will have a less than significant impact with the successful implementation of proposed mitigation measures on protected species, species of special concern, or the habitats that support these species. Such impacts will not occur because the Project activities are designed to enhance aquatic habitats and restore a mosaic of tidal wetlands.

Species or Habitat Present

KEY: Federal Endangered (FE), Federal Threatened (FT), Federal Species of Concern (SC), State Endangered (SE), State Threatened (ST), and Species of Special Concern (SSC).

- Queries were run of the California Natural Diversity Database (CNDDDB) and USFWS's official species list of threatened and endangered species, for the Fields Landing quadrangle and surrounding seven quadrangles: Arcata South, Cannibal Island, Eureka, Ferndale, Fortuna, Hydesville, and McWhinney Creek (see Appendix 2). The USFWS CCP/EA was also consulted as it provides list of protected species and species of special concern that have been observed at the Refuge (USFWS 2009). In 2006, an intensive site inventory and mapping was conducted of existing vegetative types (estuarine, palustrine, and upland) (see Figure 5) and species of special concern in the Refuge (Pickart 2006). The Refuge ecologist made a reconnaissance visit to West Unit in 2012.

Wildlife

Special-status wildlife species with potential to occur in the vicinity of the project area are listed in Appendix 2. Special status wildlife species with moderate or high probability of occurrence in the project area are listed in Table BIO-1. The special-status animal species that are likely to occur in the vicinity of the project area are described below. Expanded descriptions are included only for those species for which suitable habitat exists in the project area. There are several special-status species known to occur in habitats that are present on the site or that may forage in the project area, including Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*) (fall/winter), northern harrier (*Circus cyaneus*), black-capped chickadee (*Poecile atricapillus*), and yellow warbler (*Dendroica petechia*). Some special-status species are known to occur in the general local area but are thought to be absent from the project site due to lack of habitat, or occur only rarely as stray migrants or transients. These include golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), and bank

swallow (*Riparia riparia*).

Other species expected to breed or forage on the site infrequently include the double-crested cormorant (*Phalacrocorax auritus*), osprey (*Pandion haliaetus*), and American peregrine falcon (*Falco peregrinus anatum*). Bald eagles (*Haliaeetus leucocephalus*) may occasionally perch on the project site while foraging within the project site and in adjacent water during the winter; however, there is no breeding habitat for bald eagles on the site. The following species are likely to be found on portions of the project site that may be affected by the proposed restoration:

Fish

- In the Project area, there is likely one protected fish species (pursuant to the federal or state Endangered Species Acts) present: tidewater goby (*Eucyclogobius newberryi*) (FE). Tidewater goby has been documented in the Project Area (Cole 2004). Coho salmon, Chinook salmon, steelhead, and coastal cutthroat trout are present in Salmon Creek to the south of the Project Area, but are unlikely to occur in the Project Area itself because the tidegates most likely prevent these species from entering the area. Green sturgeon, longfin smelt, and Pacific lamprey are unlikely to be present for the same reason. There is no known salmonid spawning in Chisum Creek in the Project Area or upstream.
- According to USFWS (2005), tidewater goby (TWG) is a small fish, rarely exceeding 2 inches in length. Most individuals complete their life cycle in one year, but in northern California fish can live as long as 3 years (Chamberlain 2005). TWG are exclusive to brackish habitats for their entire life cycle, and prefer water with salinity less than 12 parts per thousand (ppt), but can be found in water of 0-41 ppt. They can live in water at temperatures of 46-73 degrees Fahrenheit (F), but require well-oxygenated water, disappearing from waters that stagnate or stratify (Moyle 2002). TWG, as weak swimmers, prefer slow, shallow water 10-39 inches deep with substrate of sand and silt surrounded by beds of emergent vegetation; open water areas are needed for reproduction and vegetated areas are needed for over wintering. Spawning occurs in lagoons/estuaries from April through November. Suitable water temperatures for nesting are 75.6 to 79.6 degrees F with salinities of 2 to 27 ppt. Larvae emerge and live in vegetated areas until they reach 0.5-0.7 inches when, as juveniles, they ascend and occupy streams for rearing (Moyle 2002). From June through August there are two distinct age classes of juvenile and adult fish (McGourty 2005). Populations may be regulated by physical factors such as strong tidal actions and poor water quality or by biological parameters such as lack of vegetative cover or predation by salmonids. McGourty found that silt vegetated strata supported the greatest numbers of gobies (significantly higher than all other strata). TWG are reported to ascend farthest upstream when there is a well-developed riparian corridor. One consequence of channelization is an increase in water velocity and depth during high flows that can scour areas where TWG have little protection. Moderate to high flows can result in TWG being swept downstream and subsequent mortality. Diking and draining of tideland/wetlands has resulted in the removal or degradation of important TWG rearing

and refuge habitats around Humboldt Bay (USFWS 2005).

- There is federally designated critical habitat in the Project area for green sturgeon. Federally designated critical habitat for coho and Chinook salmon, steelhead, and TWG is located in the adjacent Salmon Creek Unit, but is not located in the White Slough Unit.

The Magnuson-Stevens Act also protects anadromous fish species and their Essential Fish Habitat (EFH) under the following Fishery Management Plans (FMP): Pacific Salmon FMP, Pacific Groundfish FMP, and Coastal Pelagics FMP. These species are presumed to be absent from the Project Area because dikes and tidegates block access.

Amphibians and Reptiles

- There is one species of amphibian and one reptile likely to occupy the Project area that the state designated as SSC: northern red-legged frog (*Rana aurora*) and northwestern pond turtle (*Actinemys marmorata marmorata*).
- The northern red-legged frog are not salt tolerant. They utilize freshwater emergent wetlands, freshwater streams and riparian areas as well as seasonal freshwater wetland (pasture) in the Project area. Northern red-legged frog breed December to April in ponds and streams, tadpoles develop through the spring and undergo metamorphosis June through August, adult frogs seek out water greater than 3 feet deep for escape from predators (USFWS 2002). When not breeding adult red-legged frogs tend to spend time away from aquatic breeding areas in riparian and upland habitats (van Hattem 2010). There is an abundant population of northern red-legged frogs on the Refuge, in and adjacent to the Project area.
- Northwestern pond turtles occupy a wide variety of habitats and breed April to May; nests are built along stream or pond margins and in upland areas and eggs are laid from April through August, with hatchlings emerging twelve weeks later, July through November. Pond turtles can tolerate brackish and even tidewater; they prefer pools to shallow water but can be found in wetlands, ponds, irrigation ditches and streams (www.CaliforniaHerps.Com). Northwestern pond turtles do occur in seasonal wetlands and flooded fields on the Refuge (USFWS 2009).

Birds

- There are no federally listed bird species utilizing the Project area.
- Brown pelican (*Pelecanus occidentalis*) (Federally and state delisted, State Fully Protected), are present in Hookton Slough, but not Salmon Creek or White Slough.
- There are several bird species covered under California's Protected Species statutes (Fish and Game Code Sections: 3503.5, 3505, 3511). While not given the designation of "Fully Protected", birds in the orders Falconiformes and Strigiformes have special status under Section 3503.5 since "take" (capture or kill) cannot be authorized. The

same can be said for egrets (as specified in Section 3505) since “take” is considered unlawful. The general breeding period for those species likely to nest near the Project area is February through August.

Bitterns, Herons and Egrets (Ardeidae)

Seven species in the family Ardeidae may utilize the Project area: American bittern (*Botaurus lentiginosus*), great blue heron (*Ardea Herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), cattle egret (*Bubulcus ibis*), green heron (*Butorides virescens*), and black-crowned night heron (*Nycticorax nycticorax*).

American bittern, great blue heron, snowy egret, green heron, and black-crowned night heron forage in freshwater, brackish-water, and tidewater environments. Great egrets and cattle egrets forage in seasonal freshwater wetlands or pastures. Great blue heron, great egret, snowy egret, cattle egret, and black-crowned night heron are colonially nesting species. There is a rookery above Hookton Road north of Table Bluff in the Project vicinity (Hunter 2005). Green heron is a solitary nester that utilizes riparian habitat, and no nests have been observed in the Project area (USFWS 2009).

Diurnal Raptors (Accipitridae)

Fifteen species of diurnal raptors may utilize the Project area: northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), sharp-shinned hawk (*Accipiter striatus*), Cooper’s hawk (*A. cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*B. jamaicensis*), rough-legged hawk (*B. lagopus*), ferruginous hawk (*B. regalis*), Swainson’s hawk, bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), merlin (*Falco columbarius*), prairie falcon (*F. mexicanus*), American kestrel (*F. sparverius*), and Peregrine falcon (*F. peregrinus anatum*).

These raptors can occupy a wide variety of habitats such as open pastures, forest edges, and open water. Of these fifteen species only the following eight are known to breed on or near the Refuge but not in the Project area: Cooper’s hawk, red-tailed hawk, red-shouldered hawk, northern harrier, white-tailed kite, osprey, American kestrel, and bald eagle (USFWS 2009).

Owls (Strigiformes)

Nine owl species may utilize the Project area (USFWS 2009): long-eared owl (*Asio otus*), burrowing owl (*Athene cunicularia*), barn owl (*Tyto alba*), short-eared owl (*A. flammeus*), great-horned owl (*Bubo virginianus*), barred owl (*Strix varia*), northern saw-whet owl (*Aegolius acadicus*), western screech owl (*Otus trichopsis*) and northern pygmy-owl (*Glaucidium gnoma*).

Three species utilize grassland habitat: long-eared owl, burrowing owl, short-eared owl, and two species are occupy a wide range of habitats: great-horned owl and barn owl. Of these, the following two species likely breed on the Refuge near the Project area (Hunter 2005): great-horned owl and barn owl.

- There are three bird species of special concern (SSC) that may utilize the Project area: black tern (*Chlidonias niger*), a migratory and very rare species that frequents marine, estuarine, and palustrine habitats such as seasonal freshwater wetlands (pastures); tricolored black bird (*Agelaius tricolor*), an uncommon migratory species that occupies palustrine habitats such as freshwater emergent wetlands and seasonal freshwater wetlands (pastures); and Vaux's swift (*Chaetura vauxi*) a migratory species and summer resident that nests in redwood or Douglas fir forests. None of these species are known to breed on the Refuge (USFWS 2009).

Plants

A review of the CNDDDB, USFWS database, and Refuge CCP/EA indicated that 40 special status plant species have the potential to occur in the project vicinity (Appendix 2). Of these species, 31 species only occur in habitat types, such as coastal dunes or salt marsh, which are not found within the project area, and are therefore presumed to be absent. The remaining 9 species have the potential to occur in the project area. Botanical surveys will be conducted to provide more data regarding the presence or absence of special status plant species (DFG 2000). A late spring and/or early summer (June) survey of the Project Area will be necessary to determine if these species are present (See Table BIO-2 for specific species and survey times).

Lyngbye's sedge is the special status plant species most likely to occur in the Project Area (*Carex lyngbyei*). This species has no state or Federal listing status and is on California Native Plant Society List 2.2. This rhizomatous herb occurs in coastal brackish or freshwater marsh, where it can form dense monotypic stands. The blooming period extends from May to August. The range of this species includes four counties in California, extending north from Marin County into Oregon. A botanical survey will determine whether Lyngbye's sedge is present in the Project Area.

Potential Project Effects on Species

Fish

- There is potential for a small number of TWG to be present during construction in the Project area. Installation of fish-excluding nets, and capture/relocation of any fish will minimize potential mortality of TWG or any other species during Project implementation. Limited work will be conducted in wetted areas that could impact TWG. The following actions could impact TWG: (1) Construction of two temporary tidal channel crossings at the south end of the site; (2) Filling portions of agricultural drainage ditches; (3) Breaching levees; (4) Removing tide-gates; and (5) Dewatering.

Amphibians and Reptiles

- Northern red-legged frogs (SSC) complete their metamorphosis by the end of August. Eggs and tadpoles are not expected to be present in Chisum Creek and the drainage ditch during low flow season (July through October) when construction activities are

planned in these areas as warm, brackish water conditions are not utilized by this species.

- If metamorphosing red-legged frog tadpoles are present in the Project Area in July or August, or adult frogs from July through October, they could be affected by construction activities. Survey and relocation will minimize these effects. Due to the breach of the dike in August 2014 and the leakiness of remaining dikes and tidegates, most of the open water areas on the site are saline, and are unlikely to support red-legged frog tadpoles.
- While tidal influence will be restored to the Project Area, only a small area of freshwater habitat appropriate for red-legged frogs is currently present. A similar or greater area of freshwater wetland will remain after project implementation, as Chisum Creek will be routed across a greater distance of the Project Area to the southwest to maximize the salinity gradient across the site.
- Northwestern pond turtles build their nests along stream or pond margins and in upland areas and lay eggs from April through August, with hatchlings emerging twelve weeks later July through November. Excavation of the creek banks in Western White Slough could directly impact turtles if they have made nests and laid eggs in stream banks or levee sides in these areas.
- If northwestern pond turtle hatchlings or adults are present from July through October they could be affected when flow is re-directed from the diversion ditch to the new channel. However, these reptiles would be capable of moving overland from the old channel to suitable habitat in the new channel.
- Northwestern pond turtles (SSC) could be affected when vegetation is cleared for excavation. To minimize possible effects, surveys will be made prior to vegetation clearing and nests will be flagged for avoidance until after hatchling emergence; adults and hatchlings will be relocated out of the work area.

Birds

- No protected or SSC birds' nests or roosts have been observed in the Project area (personal communication E. Nelson), therefore direct impacts are not likely from the proposed actions. During construction, if protected or SSC birds are present they would likely be displaced from the Project area for the short-term if they were utilizing the area to forage or roost..

Plants

- There is potential habitat for 9 plant species of concern in the Project area. Surveys will be conducted to determine whether these species are present. If any of these species are present, grading and filling could result in the loss of populations of these species. Project effects on these species will be minimized by surveys carried out at the appropriate time of year prior to ground-disturbing activities. Any plants will be flagged for avoidance if possible or for transplant either to temporary storage for re-planting or to suitable habitat out of the disturbance area.

Potential Adverse Effects to Species Habitats

Fish

- During construction, direct affects to existing fish habitat in the Project Area could occur due to dewatering an approximately 3,000 ft section of tidal channels. . Construction will include excavation of new channels and depressional wetlands that will increase the area and connectivity of channels and depressional wetlands. Impacts to existing channels and ponds will be limited to placement and removal of two temporary stream crossings, filling of portions of wetted agricultural drainage ditches, and to disturbance associated with breaching levees.
- Indirect short-term impact on water quality from increases in suspended sediment and turbidity may occur in White Slough following the introduction of flow into newly constructed channels and ponds.
- Indirect short-term impact on water quality in White Slough could occur as a consequence of construction if disturbed or exposed soils are left unprotected from rainfall and stormwater runoff and increased turbidity occurs before these surfaces are vegetated or mulched. Impacts will be minimal because there will be a 20-foot buffer between placement of fill and any open water areas or channels

Amphibians and Reptiles

- Northern red-legged frogs or northwestern pond turtles may be directly affected when Chisum Creek flow is diverted into the new channel, and the existing channel/drainage ditch is reduced in flow.

Birds

- The Project will directly affect brackish marsh habitat utilized by several bird SSC. In the short-term, 4 acres of pasture/seasonal wetland will be used as a staging area for fill and equipment, and 32.5 acres of brackish marsh habitat will be impacted from placement of fill to restore a mosaic of tidal marsh. This short term impact will prevent the long term conversion of these habitat types to mudflat that would occur without project implementation due to dike failure.

Plants

- There is a potential to damage populations of special status plant species of concern if present due to scraping and placement of fill.
- Eelgrass populations in and adjacent to White Slough could be temporarily impacted by increased turbidity due to project construction.

General

- In June 2009, USFWS determined that the Refuge's proposed actions, as described in its 2009 Comprehensive Conservation Plan (CCP) including the Project, may affect but are not likely to adversely affect any of the species of concern, based on the conservation measures listed in Appendix 1 of the CCP/EA.
- The project will increase estuarine habitat areas by restoring full tidal exchange to the Project Area and constructing 2.3 ac of new channel and 2.3 acres of new depressional wetlands/ponds in the West Unit. The network of tidally influenced channels and off-channel ponds will greatly increase aquatic habitat diversity, as well as establish a suite of vegetative cover types ranging from salt marsh to submergent-emergent aquatic and riparian vegetation.
- Overall, any of the short term effects on species and their habitat is expected to be more than compensated for by the long-term improvement in habitat with improved estuarine habitat complexity and increases in salt-marsh and riparian habitat, as well as the avoidance of marsh conversion to mudflat which could occur due to dike failure and sea level rise.
- The increased marsh elevation, tidegate and channel capacities resulting from the Project will ease the short-term effects of predicted sea level rise and the possible increase in precipitation and streamflow as a result of global warming. The establishment of a network of tidal channels and a variety of habitat by this Project also sets the stage for a smoother transition to increased sea level and attendant inland migration of the mudflat, salt marsh, brackish marsh, and freshwater habitats. Continued coordination with the upstream landowner to improve channel stability and habitat complexity in the Chisum Creek stream reach above the Project area will also be important as sea level rises. The estuary ecotone (transition from brackish to freshwater habitat) is likely to shift upstream, as predicted elsewhere, with sea level rise over the next 50 to 100 years.
- Refer also to Section 8, Hydrology and Water Quality, for an assessment of Project impacts on hydrology and water quality and discussion of proposed mitigation measures and Best Management Practices (BMP).

4 (a) Mitigation Measures:

1. Construction will only occur between July 1st and October 31st when freshwater discharge into Chisum Creek is at its lowest and when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction. Construction during this period will provide tidewater goby, if present, the opportunity to ascend the existing creek channel.
2. Installation of temporary block nets or fish screens in the tidal channels and Chisum Creek

will occur prior to all diversions or dewatering of any wetted channels, where work is to occur, to isolate and facilitate relocating any fish or amphibians. Relocation of fish and amphibians using electrofishing, seines, and dipnets will be coordinated with DFG, Refuge, and USFWS staff as appropriate. During, and immediately after de-watering, an authorized fish biologist will conduct a survey of the areas being de-watered for stranded fish or amphibians. Any stranded fish or amphibians shall be collected, recorded, and relocated to adjacent waters with appropriate habitat conditions.

3. Aquatic habitat will be impacted by pumping for the shortest time necessary to complete construction or excavation. Pumps used to de-water work areas will utilize a fish screen on the inlet of sufficiently sized mesh to prevent entrainment of TWG.
4. Surveys of aquatic habitat by a qualified biologist for juvenile red-legged frogs will occur two weeks prior to disturbance activities in the areas to be de-watered (July through August). Any red-legged frogs found will be relocated to suitable areas outside of the area of disturbance. Construction activities in pasture in the West Unit Area will occur only when the area is dry and when adult red-legged frogs are not expected to be present.
5. Northwestern pond turtle surveys will be carried out by a qualified biologist along stream or pond margins two weeks prior to commencement of ground disturbing activities (July and August). Surveys will be utilized to locate and flag northwestern pond turtle nests with eggs, or to remove hatchlings and adults that may be present in the stream reaches above the existing tidal zone below first diversion. Any active nests located will left undisturbed until hatchlings have emerged or have been relocated to suitable areas outside of the area of disturbance, similarly relocation of any adults found will occur. No existing freshwater ponds will be impacted by the Project.
6. Surveys by a qualified biologist for nesting birds 1,000 feet beyond the limits of disturbance will occur two weeks prior to commencement of ground-disturbing activities. If breeding is confirmed of any special status birds, construction activities that would degrade or remove breeding habitat will not occur in the immediate vicinity until the end of the breeding period for that species or until the breeding effort has either been determined to have failed or the young have been determined to have fledged.
7. A qualified botanist will survey for the 9 plant species of concern potentially occurring in the Project Area. If such plants are found, populations will be mapped and flagged, and avoided if possible. If populations of these plants cannot be avoided during excavation or grading they will be removed as “wafers” (top 12 inches of vegetation/topsoil) and either transplanted immediately or stored separately on pond liners. These soils will be kept moist until they are re-placed at the appropriate finished grade and in the same orientation, or transplanted to another area of suitable habitat on the Refuge.
8. Disturbance of perennial wetlands and open water habitats shall not exceed the minimum necessary to complete construction activities.
9. Vegetative disturbance will be contained within the limits of grading and kept to a minimum area.

10. To minimize disturbances to the existing marsh, work will be phased as described in the Project Description. Impacts will be minimized by not placing fill in open waters, with the exception of several reaches of agricultural drainage ditches, and by maintaining a 20-foot buffer between open water and fill areas. If required, dewatering will be performed to limit work to dry areas. Construction best management practices will be followed to prevent sediment entering open waterways.
11. The Project will restore up to 26 acres of salt marsh habitat in the West Unit Area.
12. The Project will improve aquatic and bird habitat by creating depressional wetlands/ponds, increasing channel complexity and reducing stranding potential by increasing floodplain connectivity. Reconnecting this habitat to the estuary directly allows the whole suite of estuarine function to return to what is currently a degraded former salt marsh.
13. The Project will improve tidewater goby habitat by increasing the long term persistence of fresh and salt water mixing in the tidal marsh complex in the Project Area.
14. Construction will only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction.

Monitoring Method:

- A qualified biologist will identify, record, and report to DFW, Refuge, USFWS, and NMFS as appropriate fish captured and relocated, or the occurrence of any mortality.
 - A qualified biologist will identify, record, and report to DFW and Refuge as appropriate red-legged frogs or northwestern pond turtles captured and relocated, or the occurrence of any mortality.
 - A qualified biologist will identify, record, and report to DFW, Refuge, and USFWS as appropriate any bird SSC that are actively breeding in or near the area of disturbance.
 - A qualified botanist will conduct a floristic survey of the construction area prior to the area being disturbed, during the appropriate flowering periods for the 9 plant species of concern to document and report their occurrence and location to DFW and the Refuge.
 - A qualified botanist will monitor any plant species of concern throughout the construction season to ensure they are not being disturbed, including eelgrass populations in and adjacent to White Slough. Successful mitigation will be determined if plant species of concern are in a density and total area consistent with pre-impact conditions in 5 years.
 - Several photographic points will be established to document all work performed. Photographs will be recorded in sufficient frequency to document each stage of work.
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural

community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?

Threshold of Significance for this initial study: A net reduction of ecological functions or values in riparian habitat or other sensitive natural communities.

Assessment: The Project with the successful implementation of mitigation measures will have less than significant impact on riparian habitat and may temporarily impact eel grass areas in White Slough due to increased turbidity. The most recent eelgrass mapping (Schlosser and Eicher 2012) did not document any eelgrass in and adjacent to the project area. However, eelgrass populations are dynamic and patches may occur in White Slough. There are no other sensitive natural communities in the Project area other than waters of the US and State, which are assessed under 4 (c).

- The Project may impact up to 1 acre of eelgrass in and adjacent to White Slough.

4 (b) Mitigation Measures:

Construction will only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction.

Monitoring Method:

- Several photographic points will be established to document all work performed. Photographs will be recorded in sufficient frequency to document each stage of work.

c) Have a substantial adverse effect on state or federal protected wetlands or waters through direct removal, filling, hydrological interruption, or other means?

Threshold of Significance for this initial study: Adversely affect protected wetlands or waters, resulting in a net reduction of functions, values, or area.

Assessment: The Project will have less than significant effect with the successful implementation of the restoration of tidal wetlands and enhancement of existing freshwater and brackish water wetlands, resulting in a diverse tidal marsh complex in the Project Area (see Table 2).

- The Project will increase salt marsh habitat by increasing surface elevation of 40 acres of diked brackish marsh and restoring tidal influence in order to support salt marsh and brackish marsh vegetation. No net loss of wetlands and waters will occur as a result of the project.
- Grading of exterior dike will restore 0.8 ac of salt marsh.
- A temporary stockpile area will directly affect 4 acres of muted brackish marsh. The

area will be restored to tidal marsh as part of the Project.

Table 1. West Unit Land Cover By Category Before and After Restoration

Land Cover Type	Acreage Before Restoration	Acreage After Restoration
Waters of the U.S.		
Channel*	1.5	2.3
Brackish Pond	0	2.3
Wetlands		
Salt Marsh	0	26.0
Brackish Marsh	35.5	7.4
Freshwater Wetland	0.1	0.1
TOTAL WETLANDS AND WATERS	37.1	38.1
Uplands (Dikes)	3.0	2.0
Total Project Area	40.1	40.1

*Channel area before construction includes 1 ac of remnant slough channels, 0.1 ac of drainage ditches, 0.4 ac of levee borrow ditch. Channel area after construction includes 2.2 ac of tidal channels and 0.1 ac of Chisum Creek channel.

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Threshold of Significance for this initial study: Long-term disruption of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. Physical alterations to topography, hydrology or vegetation that fragment contiguous habitat areas.

Assessment: The Project will have no long-term impact on the movement of fish or wildlife, nor impede the use of wildlife nursery sites. The Project will enhance the movement of fish species by increasing the connectivity of channels in the Project Area with White Slough and Humboldt Bay. It is expected that restoration of tidal influence and connection of Chisum Creek to White Slough and Humboldt Bay may provide an opportunity for the movement of fish into Chisum Creek from Humboldt Bay.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Threshold of Significance for this initial study: Failure to comply with local policies or ordinances with jurisdiction over the Project that protects biological resources.

Assessment: The Project is located on federal land. Local land use authorities and policies do not have jurisdiction or direct application to Refuge activities on its lands

f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Threshold of Significance for this initial study: Obstruct or prevent the recovery of any listed species covered in an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan.

Assessment: The Project will have no impact to an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

- According to the USFWS' habitat conservation plan web site, http://ecos.fws.gov/conserv_plans/servlet/gov.doi.hcp.servlets.PlanReportSelect?region=8&type=HCP , there are no Habitat Conservation Plans covering the project area.
- According to DFW's natural community conservation planning web site, <http://www.dfg.ca.gov/habcon/nccp/status/index.html> , there are no Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans covering the project area.
- The project has been assessed in the Refuge's Comprehensive Conservation Plan and it complies with the goals and policies of that Plan.

V. CULTURAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Title 14 §15064.5?				X
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Title 14 §15064.5?				X
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X
d) Disturb any human remains, including those interred outside of formal cemeteries?				X

Cultural Resources

a. Cause a substantial adverse change in the significance of a historical resource.

Threshold of Significance for this initial study: Result in physical changes in the significance of a historical or cultural resource as defined in CEQA Guidelines Section 15064.5.

Assessment: The Project will have no impact on any historic or cultural resource

- There are no buildings in the Project area.
- Prior to reclamation the Project area was formerly tidelands, and as such was not suitable for human habitation.
- The Project involves ground disturbing activities in several types of wetlands habitats. These wetlands are located on former tidelands that were diked, drained and cleared in the 20th Century, used for grazing and hay production, and most recently managed for open space and fish and wildlife habitat.
- The Project will excavate portions of an exterior dike, which is not considered an historic resource as defined in CEQA Guidelines Section 15064.5.
- A 1990, USFWS cultural resources record search and survey in compliance with Section 106 of the National Historic Preservation Act, determined that the

Refuge, including the Project Area, does not have any significant cultural resources.

- FWS will do a section 106 consultation with the three Wiyot area Tribes as required under the National Historic Preservation Act.
- On an as needed basis a USFWS cultural resources monitor may be present during construction activities.
- In the event that historical or cultural resources are discovered during grading or other construction activities, work shall be halted within a 100 foot radius of the find. The Refuge shall notify State Historic Preservation Officer, Northwest Information Center, and Wiyot Tribe.

b. Cause a substantial adverse change in the significance of an archaeological resource.

Threshold of Significance for this initial study: Result in physical changes in the significance of an archaeological resource defined in CEQA Guidelines Section 15064.5.

Assessment: The Project will have no impact on an archaeological resource.

- According to an 1870 U.S. Coast Survey (T-1174) the Project area was composed entirely of a salt marsh and tidal channels (see Figure 6: 1870 channel overlay onto 2005 Aerial Photo).
- According to Loud's Ethnogeography and Archaeology of the Wiyot Territory (1918) there "was a permanent Wiyot village site (86) close to the bay near Whites slough where a creek came down" (pg.271). This village site is likely inland of the Project area in upland areas near the vicinity of the Highway 101, NWP railroad, or Tompkins Hill road. Further, Loud does not describe cultural or archeological sites within tidelands or marshes of South Humboldt Bay.
- Before reclamation the Project area was subject twice daily to the ebb and flow of tides, therefore this environment was not conducive to the preservation of cultural or archaeological resources.

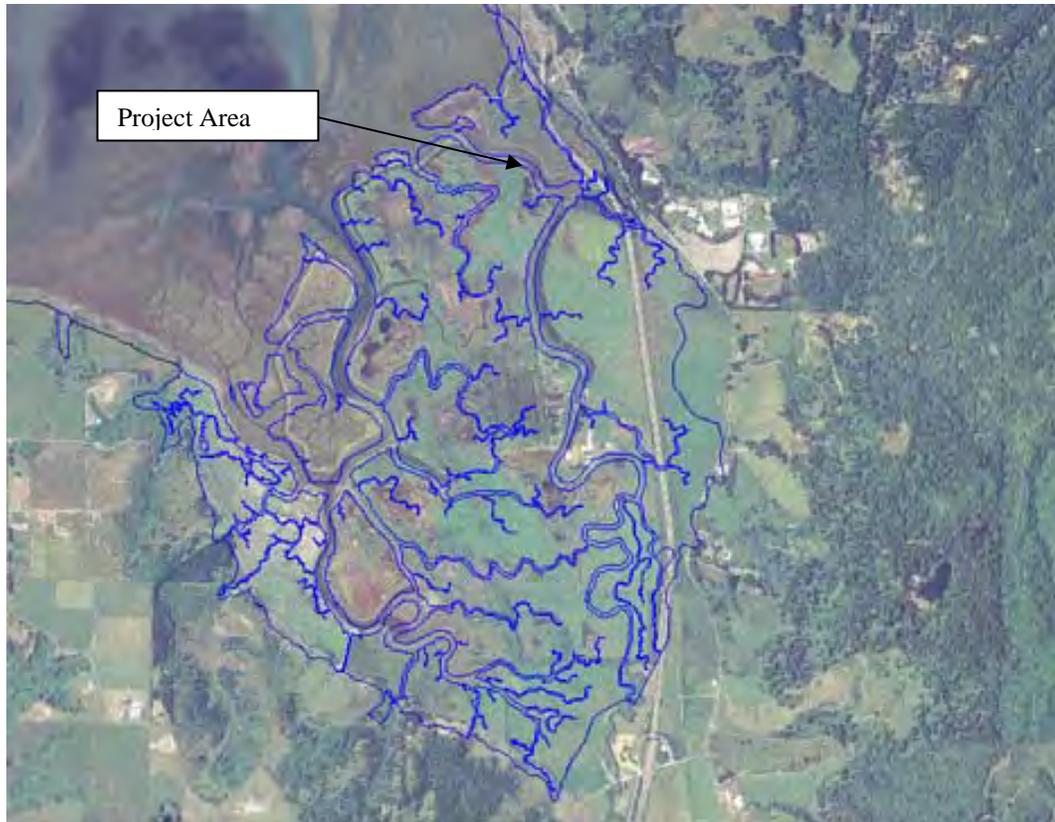


Figure 6. 1870 US Coast and Geodetic Survey channel overlay of Project area (2005 Aerial photo).

- In 1990, US Fish and Wildlife’s regional archaeologist (A.W. Raymond, 1990) performed record searches at the California Historical Resource Information Center, consulted with the Wiyot Tribe, and conducted a field survey of the Refuge including the White Slough Unit and the Project area. Fieldwork and archival research indicated that no significant cultural resources occur within the Project area.

c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic features.

Threshold of Significance for this initial study: Result in physical changes or destruction of a unique paleontological resource or site or unique geologic feature.

Assessment: The Project will have no impact on a unique paleontological resource or sites or unique geologic feature as there are none in the Project area.

- According to an 1870 U.S. Coast Survey the Project area was composed entirely of a salt marsh and tidal channels.

d. Disturb any human remains, including those interred outside of formal cemeteries.

Threshold of Significance for this initial study: Disturbance of human remains.

Assessment: The Project is expected to have no impact on human remains as interment of human remains in tidelands was/is not a normal practice.

- According to an 1870 U.S. Coast Survey the Project area was composed entirely of a salt marsh and tidal channels.
- In the mid- to late 20th century the Project area was used for grazing and raising hay; however the area was frequently flooded by White Slough and therefore was an unlikely area for human burial.
- On the remote chance that human burial or remains are uncovered all work will cease and the County Coroner will be contacted to address the disposition of such remains. FWS and contractors would also refer to a recently written document by Blue Lake Rancheria THPO J. Eidsness, “Protocols for Inadvertent Archaeological Discoveries” for guidance and direction.

VI. GEOLOGY AND SOILS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			X	
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?			X	
ii) Strong seismic ground shaking?			X	
iii) Seismic-related ground failure, including liquefaction?			X	
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?			X	
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?				X
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?				X
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X

Geology and Soils

a. Expose people or structures to potential substantial adverse effects from earthquakes, strong seismic ground shaking, seismic-related ground failure liquefaction, or landslides.

Threshold of Significance for this initial study: Project located in a known active earthquake fault zone.

Assessment: The project will have no impact. The project will not expose people or structures to effects from earthquakes, strong seismic ground shaking, seismic-related ground failure liquefaction or landslides.

- The Project will not be constructing any structures for human habitation or use.
- The risks associated with seismic activity, including regional subsidence, tsunami potential and sea level rise in the Project area are beyond the influence of the Project. If a major seismic event occurs in the area, any effect resulting from the Project will be insignificant in comparison to the effect on other infrastructure and human activities.
- The Project area has experienced seismic activity with strong ground motion during past earthquakes and such events will occur in this area at some point(s) in the future. The level of ground shaking expected has potential to produce significant deleterious effects on the Project including: settlement or differential settlement of marsh surface, bank collapse, and liquefaction. Historically there have been several documented cases of liquefaction affecting lowland deltaic areas in the Humboldt Bay region that may cause settlement of the restored tidal marsh surface and channel network in the Project Area (Pacific Watershed Associates 2009).
- Geotechnical investigations of the adjacent Salmon Creek area indicate as many as 5 stratigraphic horizons over a 3,500 year period providing evidence of co-seismic subsidence, with a vertical displacement range of 0.9 to 3.1 meters per event, with evidence consistent with concurrent tsunami deposition (Pacific Watershed Associates 2009).

b. Result in substantial soil erosion or loss of topsoil.

Threshold of Significance for this initial study: Substantial acceleration of the rate of soil erosion at the Project site or the loss of top soil.

Assessment: The Project will have a less than significant impact regarding soil erosion or loss of topsoil.

- Temporary equipment access, excavation, placement of fill, grading, and construction will disturb nearly 41.0 acres.

- The existing vegetation will be buried during grading and the Project area converted to inter-tidal and brackish water wetlands and mudflats.
- Expansion of the tidal prism will initiate passive colonization of inter-tidal wetland and brackish water vegetation.

c. Cause soil or geologic unit to become unstable as a result of the Project by causing instability, on or off-site landslides, lateral spreading, subsidence, liquefaction or collapse.

Threshold of Significance for this initial study: Substantially de-stabilize an otherwise stable soil or geologic unit.

Assessment: The project will have no impact on stability of the underlying soil, nor have any potential to initiate landslides, lateral spreading, subsidence, liquefaction or collapse.

- The Project area is underlain with former tidelands soils characterized as dense clay.
- The Project will be placing a maximum of 6.0 feet of fill.

d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Threshold of Significance for this initial study: Located on expansive soils.

Assessment: The Project will have no impact, is not located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994).

- The Project will not create risks to life or property because it does not involve the construction of any structures for human habitation.

e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Threshold of Significance for this initial study: Located on underlying soils that are not capable of adequately filtering wastewater or alternative waste water disposal systems.

Assessment: The Project will have no impact, there are no habitable structures at the Project site; hence there is no need for septic tanks or alternative waste water disposal systems.

VII. GREENHOUSE GAS EMISSIONS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?			X	
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?			X	
a. Generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment?				

Threshold of Significance for this initial study: Substantial generation of GHG emissions due to project implementation.

Assessment: The Project will have a less than significant impact in terms of generating GHG emissions.

- Use of heavy equipment necessary to implement the Project will contribute to GHG emissions in the short term.
- The long term benefits of improved carbon sequestration in the tidal marsh may contribute to an overall reduction in GHG emissions. Refer to the previous assessment under 3a. The Project is likely to result in a cumulative net increase in carbon sequestration and potential for reduction in methane production.

Potential impacts to air quality and GHG emissions were analyzed utilizing the California Emissions Estimator Model (CalEEMod) Version 2013.2 (www.CalEEMod.com). CalEEMod is a statewide computer model developed in cooperation with air districts throughout the state, to quantify criteria pollutant and GHG emissions associated with the construction and operational activities from a variety of land use projects. The program was designed in part for use in analyzing air quality and GHG impacts in CEQA documents. Construction emissions estimated for the proposed project were modeled over the course of two 120-day construction seasons. Long-term maintenance of the project could result in a slight increase in GHG emissions over the existing baseline, but this increase is not expected to be significant as the project is expected to result in a self-sustaining tidal marsh which will be a carbon sink, as discussed below. As addressed herein, the primary GHG contributions from the project are short term and temporary,

resulting from construction, and are offset by the long-term carbon sequestration in the restored tidal marsh.

The project would contribute to GHG primarily through the use of diesel-powered construction equipment. There would be no net long-term emissions (permanent sources) of GHG from the project. The combustion of diesel fuel in off-road construction equipment and on-road vehicles (trucks, etc.) would emit GHGs consisting mainly of carbon dioxide (CO₂), along with small amounts of methane (CH₄) and nitrous oxide (N₂O).

The emissions-based carbon footprint for the construction of the project was estimated using:

- estimated construction equipment needed, their fuel consumption, and total hours of operation;
- estimated number of days for construction;
- estimated volumes of imported fill and on-site grading and cut-and-fill
- estimated truck trips and trip distances for importing fill.

Using this methodology, the estimate for construction-related emissions for the project is 945.01 tons of CO₂-equivalent. Methods used for this estimate can be found in Appendix 3.

The long-term effect of the project on carbon sequestration in the project area was evaluated by comparing the estimated carbon flux in existing and post-project land cover types. A recent summary of existing data (Philip Williams and Associates 2009) suggests that freshwater wetlands, riparian forest, brackish wetlands, and salt marsh all have high rates of carbon sequestration. However, wetlands also produce methane, which is a potent GHG, during anaerobic decomposition in low-salinity, saturated soils. Methods for measuring carbon sequestration and methane production in wetlands are just becoming standardized. Carbon budgets of this range of habitats may vary based on site specific conditions; however, the following relationships give us an estimate of the effect of this restoration on GHG emissions. The carbon sequestration benefit of freshwater wetlands is offset by their production of methane. Seasonal wetlands and riparian habitat produce less methane than perennial freshwater wetlands as they dry out during summer when methane production in saturated soils is greatest, due to anoxic conditions (Philip Williams and Associates 2009). While mudflats produce little methane, they also sequester little carbon. Therefore, restoring tidal salt marsh wetlands is an effective means to sequester carbon while reducing methane emissions.

The Project will convert: 1 acre of dikes to open water channel (0.8 acres) and salt marsh (0.2 acre), and 28.1 acres of brackish marsh to salt marsh (25.2 acres), and shallow depressional wetland (2.3 acres) (see Table 1). This conversion will reduce the potential for the project area to emit methane in the short term, as brackish marshes have a high potential for methane emissions, and salt marsh has a low potential for methane emission. In the long term, the perimeter dike and temporary coffer dam would fail and the entire 40 acre West Unit subarea would convert to mudflat. Therefore, the long term effect of

the project is to increase carbon sequestration by restoring tidal marsh that will persist after the dike is removed.

Table 1. Project's habitat conversions and GHG emissions.

The CARBON column represents the habitat's estimated ability to sequester the GHG carbon dioxide. The METHANE column represents the estimated ability to release the GHG methane. A high level of carbon sequestration and either a medium or low level of methane production represent a net reduction in GHG emissions.

Land Cover Type	Acreage Before Restoration	Acreage After Restoration	Carbon Sequestration	Methane Emission
Waters of the U.S.				
Channel	1.5	2.3	Low	Low
Wetlands				
Salt Marsh	0	26.0	High	Low
Brackish Marsh	35.5	7.4	High	High
Palustrine Emergent/Pasture	0.1	0.1	High	High
Depressional wetland/pond	0	2.3	Low	Low
TOTAL WETLANDS	37.1	38.1		
Uplands (Dikes)	3.0	2.0	Low	Low
Total Project Area	40.1	40.1		

The 26 ac of salt marsh restored by the project would sequester carbon, at rates likely to be higher than carbon sequestration in existing brackish marsh, which emits methane at higher rates than salt marsh. Estimated rates of carbon sequestration in salt marshes range from 0.5-3.2 tons/ac/yr (Crooks 2009; Whittlesey et al. 2013). While it is difficult to estimate the net change in carbon sequestration due to the project, reductions in methane emissions are likely to result in a reduction in the GHGs emitted by the project and an increase in carbon sequestration. Over the long term, carbon sequestration in habitats restored by the project is expected to slightly reduce the impacts from the project due to construction-related greenhouse gas emissions. Because the construction-related emissions will be temporary, they are consistent with the current draft climate action plan for Humboldt County and the long-term impact of project GHG emissions is considered less than significant. No mitigation is required.

While no mitigation is required, the project will implement Best Management Practices to minimize construction-related GHGs, which may include the following:

- Use emission control devices at least as effective as the original factory-installed equipment.
- Maintain all diesel-powered equipment in a manner to minimize visible soot emissions.

- Locate stationary diesel-powered equipment and
- Minimize unnecessary idling time through application of a “common sense” approach to vehicle use, so that idling is reduced as far as possible below the maximum of 5 consecutive minutes required by California law.

b. Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

Threshold of Significance for this initial study: Project results in a cumulatively considerable net increase in GHG emissions for which California pursuant to Assembly Bill (AB) 32 desires to reduce California’s GHG emissions to 1990 levels by 2020.

Assessment: The Project will have a less than significant impact with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

Humboldt County’s Draft Climate Action Plan (2012) sets a goal of reducing long term annual GHG emissions of the unincorporated County by 31,658 tons. This reduction would meet the goal of AB 32 of reducing GHG emissions to 1990 levels by 2025. The County Plan seeks to achieve this reduction primarily by reducing vehicle miles traveled through more compact, higher density urban development. As discussed above, Project implementation is expected to result in a short term increase in GHG emissions during construction, and a small long term net increase in carbon storage. Short-term construction related emissions for project implementation will not interfere with the County’s plan to achieve reductions in GHG emissions by reducing vehicle miles traveled through more compact development. Therefore, the Project would not conflict with any plans, policies or regulations aimed at reducing GHG emissions.

VII. HAZARDS AND HAZARDOUS MATERIALS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?		X		
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?			X	
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?				X
f) For a Project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?				X
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency				X

evacuation plan?

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

X

Hazards and Hazardous Materials

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Threshold of Significance for this initial study: Storage or use of large quantities of hazardous materials that could be released into the environment.

Assessment: The Project will have a less than significant impact with mitigation as it does not involve storage or use of large quantities of hazardous materials.

- The Project's use of heavy equipment and vehicles contains a potential risk of an accidental release of small quantities of fuel, oil and coolant.
- The following BMPs shall be implemented to prevent accidental release of hazardous materials such as fuel, oil, and coolant:

NS-9 Vehicle and Equipment Fueling
TC-1 Stabilized Construction Entrance/Exit
TC-3 Entrance/Outlet Tire Wash
WM-9 Sanitary/Septic Waste Management

7 (a) Mitigation Measures:

1. Heavy equipment that will be used in the Project will be in good condition and will be inspected for leakage of coolant and petroleum products and repaired, if necessary, before work is started.
2. Equipment operators will be trained in the procedures to be taken should an accident occur.
3. Prior to the onset of work the contractor will prepare a plan for the prompt and effective response to any accidental spills.
4. Absorbent materials designed for spill containment and cleanup will be kept at that Project site for use in case of an accidental spill.
5. Stationary equipment will be positioned over drip pans.

Monitoring Method:

- The equipment operator will inspect the work site and equipment before, during and after completion of the Project to ensure that all mitigation measures to avoid impacts are properly implemented.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Threshold of Significance for this initial study: Project involves the use of large quantities of hazardous materials.

Assessment: The Project has a low potential for a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. The only sources of hazardous material arise from the use of heavy equipment on site. The implementation of mitigation measures and monitoring methods discussed in 7(a) will minimize the potential for public hazards, reducing the impact to a less than significant level.

- The Project's use of heavy equipment and vehicles contains a risk of an accidental release of fuel, oil, or coolant.
- Discharge of potential pollutants from construction sites shall be prevented using source controls to the maximum extent practicable. Potential pollutants include but are not limited to: sediment, trash, nutrients, pathogens, petroleum hydrocarbons, metals, concrete, asphalt, lime, paint, stains, glues, wood products, pesticides, herbicides, chemicals, hazardous waste, sanitary waste, vehicle or equipment wash water and chlorinated water.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Threshold of Significance for this initial study: Project is located within one-quarter of mile of a school and involves the use of large quantities of hazardous materials.

Assessment: The Project will have less than significant impact to the public or the environment as the Project does not involve the use of large quantities of hazardous materials.

- The Project will not emit hazardous emissions or handle large quantities of hazardous or acutely hazardous materials, substances, or waste.

Although the College of the Redwoods is located within 0.25 miles of the project area, the Project will not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste.

d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Threshold of Significance for this initial study: Project is located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5.

Assessment: The Project will have no impact.

- Within the Project area there are no sites that are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5; therefore the proposed Project would not create a significant risk to the public or the environment.
- If hazardous materials or what appear to be hazardous materials are encountered, work will stop in the affected area immediately and the operator or Refuge will contact 911 or the appropriate agency for further instructions.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project result in a safety hazard for people residing or working in the Project area?

Threshold of Significance for this initial study: Project is located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport.

Assessment: The Project will have no impact.

- The Project work site is not located within two miles of a public airport.

f) For a project within the vicinity of a private airstrip, would the Project result in a safety hazard for people residing or working in the Project area?

Threshold of Significance for this initial study: Project is located within the vicinity of a private airstrip.

Assessment: The Project will have no impact.

- The Project work site is not located within two miles of a private airstrip.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Threshold of Significance for this initial study: Project would prevent alerting and warning citizens, conducting evacuations, short-term feeding and sheltering, conducting search and rescue operations or using emergency evacuation routes.

Assessment: The Project will have no impact.

- The proposed Project will not prevent alerting and warning citizens, conducting evacuations, short-term feeding and sheltering, conducting search and rescue operations or using emergency evacuation routes

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Threshold of Significance for this initial study: Project is located in an area shown on a map used to identify wildland fire hazard areas. Potential exists for a significant risk of loss, injury or death involving wildland fires.

Assessment: The Project will have less than significant impact with the successful implementation of mitigation measures.

- The Project is not located in a mapped fire hazard severity rating area (Humboldt County GIS Portal 2014).
- The Project location on the Refuge is relatively isolated and the nearest buildings are over 1,200 feet away.
- The majority of the fill placement and grading will occur on diked tidelands with a low probability of fire becoming established. Equipment access will utilize access roads built along the constructed tidal ridges.
- There is a low probability that an accidental sparks from equipment or a vehicle could ignite a fire.

7(h) Mitigation Measures:

- 1 Stationary equipment will be positioned over drip pans.
- 2 All internal combustion engines shall be fitted with spark arrestors.
- 3 The contractor shall have an appropriate fire extinguishers and fire fighting tools present at all times when there is a risk of fire.
- 4 Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.

VIII. HYDROLOGY AND WATER QUALITY	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?				X
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				X
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?				X
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard				X

delineation map?

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

X

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

X

j) Inundation by seiche, tsunami, or mudflow?

X

Hydrology and Water Quality

a) Violate any water quality standards or waste discharge requirements?

Threshold of Significance for this initial study: Exceed any state water quality standards or waste discharge requirements.

Assessment: The Project will have a less than significant impact if mitigation measures are successfully implemented and will not violate any water quality standards, which will ensure that any potentially significant impacts are avoided or mitigated to below a level of significance.

- White Slough, Chisum Creek and Humboldt Bay are not listed as Section 303(d) Sediment Impaired Waterbodies.
- The water quality of White Slough and Humboldt Bay has naturally elevated levels of suspended sediment and turbidity. After project implementation and dike removal, tidewater entering the West Unit from White Slough and Humboldt Bay will inundate the Project area. Any short-term Project-related increases in suspended sediment or turbidity should not be significant given the background water quality of the tide water entering White Slough and Humboldt Bay.
- The Project should not violate any state water quality standards or waste discharge requirements, because of measures to avoid and minimize erosion and to prevent the release of hazardous materials associated with construction equipment. The Project can only proceed if a water quality certification is secured from the North Coast Regional Water Quality Control Board.
- During Project Implementation (July through October) short-term increases in suspended sediment-turbidity in channels in the West Unit may occur as a consequence of Project construction activities (excavation, placement of fill, and grading) to create new channels, and restore salt marsh habitat. However, this

increase in turbidity will be contained within the project area until the dikes are breached, reducing the duration of the impact.

- Increases in suspended sediment-turbidity in Chisum Creek, White Slough and Humboldt Bay could also occur as a consequence of Project excavation, placement of fill, and grading if exposed soil surfaces, , are left unprotected from rainfall and stormwater runoff occurs before these surfaces are vegetated or mulched. New stream and inter-tidal channels and depressional wetlands when inundated will be a short-term source of sediment, suspended sediment resulting in an increase in downstream turbidity.
- The sequence of construction has been phased to facilitate water management, erosion and sediment control and reduce impacts to natural resources. Erosion and sediment control shall comply with the California Storm Water Quality Association Storm Water Best Management Practice (BMP) Handbook for Construction, 2003.

8 (a) Mitigation Measures:

1. Construction will only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction and when there is very little freshwater flowing in Chisum Creek. Excavated materials shall not be stockpiled overwinter. Sediment control measures shall be in place while materials are being stockpiled to minimize sediment and pollutant transport from the Project site.
2. Placement of fill in the Project Area will occur when the area is not inundated by tide water.
3. Excavation shall include handling of saturated soils. Saturated soils shall be dewatered and/or transported saturated in a manner that prevents excess discharge or spillage of soils or water within the construction access areas. A silt fence will be installed around the perimeter of temporary stockpiles of saturated soils to prevent runoff from leaving the site.
4. During construction a silt fence will be deployed to isolate work areas from existing channels, and to trap suspended sediment that might leave the construction site if stormwater runoff were to occur. If the silt fence is not adequately containing sediment, the construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below.
5. No construction materials, debris, or waste, shall be placed or stored where it may be allowed to enter into or be placed where it may be washed by rainfall into waters of the U.S./State.

6. Following completion of excavation, placement of fill, and grading all ground to the limits of disturbance (except newly constructed streambeds, pond beds, and tidally inundated areas) shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Treated areas that are not exposed to tidal influence will be mulched with at least 2 to 4 inches of certified weed-free straw mulch with wheat or other straw for riparian and wetland areas and rice straw for uplands and use of a seed mix with coverage equivalent to 100 lbs/acre of barley seed and appropriate riparian vegetation for immediate erosion control. No annual (Italian) ryegrass (*Lolium multiflorum*) shall be used. In places such as stream banks, rush mattresses will be installed for immediate erosion control.
7. All temporary fill, synthetic mats and silt fences will be removed from wetlands and waters of the U.S./State immediately on cessation of construction. Biodegradable geotextile fabrics will be used, where possible.
8. Soil and material stockpiles shall be properly protected to minimize sediment and pollutant transport from the construction site.
The following BMPs shall be implemented to prevent entry of storm water runoff into the excavation site, the entrainment of excavated contaminated materials leaving the site, and to prevent the entry of polluted storm water runoff into coastal waters during the transportation and storage of excavated contaminated materials:
EC-2 Preservation of Existing Vegetation
EC-6 Straw Mulch
EC-7 Geotextile and Mats
EC-9 Earth Dikes and Drainage Swales
EC-10 Velocity Dissipation Devices
SE-1 Silt Fence
NS-2 Dewatering Operations
NS-4 Temporary Stream Crossing
NS-5 Clear Water Diversion
NS-9 Vehicle and Equipment Fueling
TC-1 Stabilized Construction Entrance/Exit
TC-3 Entrance/Outlet Tire Wash
WM-9 Sanitary/Septic Waste Management
9. Stream diversion and dewatering shall conform to the following BMP
NS-2 Dewatering Operations
NS-5 Clear Water Diversion
EC-9 Earth Dikes and Drainage Swales
EC-10 Velocity Dissipation Devices

Monitoring Method:

- The equipment operator will inspect the work site and equipment before, during and after completion of the Project to ensure that all mitigation measures to avoid impacts are properly implemented.

- Before construction work commences the equipment operator will inspect the site and document that all that turbidity control measures and appropriate BMPs are in place.
- During construction, turbidity sampling in Hookton Slough below the Project area will be taken periodically.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a substantial lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Threshold of Significance for this initial study: Substantially deplete groundwater supplies or interfere with recharge standards or waste discharge requirements.

Assessment: The Project will have no impact on groundwater supplies, recharge or the local groundwater table level.

- The existing ground water composition and movement in the Project area, which is composed of former tidelands, is most likely dominated by the hydrology of Humboldt Bay.
- The Project will expand the tidal prism of Humboldt Bay by 41 acres. The Project Area will become tidally influenced.
- Chisum Creek has the potential to provide surface freshwater to the project area and facilitate creation of a tidal marsh complex with a continuum of salinities from fresh to salt.
- If a freshwater aquifer exists at the Project site, it does not supply any local water use.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Threshold of Significance for this initial study: Substantially alter existing drainage, increasing surface runoff and/or resulting in substantial erosion or siltation on or off site.

Assessment: The Project will have no impact on surface runoff from the site which would result in erosion or siltation on or off site.

- The Project will expand the tidal prism of Humboldt Bay by restoring tidal inundation of 41 acres in the Project area, but this is not an increase in storm water runoff and therefore will not increase erosion or siltation.

- The Project will import fill to restore salt marsh habitat as well as establish a connection with Chisum Creek to expand the network of inter-tidal channels and brackish water wetlands in the West Unit.
- The Project will not increase the volume of storm water runoff from Chisum Creek to Humboldt Bay.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Threshold of Significance for this initial study: Increase the volume of surface runoff that potentially could cause localized flooding.

Assessment: The Project will have no impact, as it will not increase storm water runoff that could cause localized flooding.

- The Project will restore tidal inundation of 41 acres of former tidelands and will alter the existing drainage pattern of lower Chisum Creek but it will not increase the rate or amount of surface runoff and will not increase flooding off-site; flooding on-site is an existing and desirable condition for tidal wetlands.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Threshold of Significance for this initial study: Runoff exceeds the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff.

Assessment: The Project will have no impact on existing or planned stormwater drainage systems and will not provide substantial additional sources of polluted runoff.

- There are no existing or planned “stormwater” drainage systems in the Project area.
- The Project is located at the terminus of Chisum Creek, and will not change the sources of runoff.
- The Project by connecting Chisum Creek to tidal wetlands will increase the distribution of stormwater runoff in the Project Area and likely improve stormwater retention and water quality before it discharges to Humboldt Bay.
- Chisum Creek will be connected to tidal wetlands rather than discharging directly to Humboldt Bay. Tidal wetlands will provide additional filtration and treatment of any existing pollutants in Chisum Creek, resulting in water quality improvement.

f) Otherwise substantially degrade water quality?

Threshold of Significance for this initial study: Exceed any state water quality standards not previously assessed in 8 (a).

Assessment: The Project will have no impact, as it will not substantially degrade water quality not previously assessed in 8 (a) or exceed water any state water quality standards.

- The Project should not violate any state water quality standards or waste discharge requirements, because fill to be utilized in the project area will be tested to ensure that contaminant levels do not raise any concerns for water quality. The Project can only proceed if a water quality certification is secured from the North Coast Regional Water Quality Control Board (NCRWQCB).

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Assessment: The Project will have no impact; it does not involve housing.

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?

Threshold of Significance for this initial study: Construction of structures in the 100-year flood hazard area which would impede or redirect flood flows.

Assessment: The Project will have no impact because it will not be installing structures which would impede or redirect flood flows.

- The Project will be altering surface elevations in the Project Area through placement and grading of fill to create tidal and brackish water wetlands.

i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Threshold of Significance for this initial study: Project is located in a flood hazard area exposing people or structures to risk of loss, injury or death involving flooding.

Assessment: The Project will have a less than significant impact with successful implementation of the project design and will not result in a new exposure of people or structures to flooding.

- The Project area, Humboldt Bay, and Highway 101 are located in an area mapped as a 100 year flood zone (Humboldt County GIS Portal).
- The Project will breach and lower the dike elevation, currently averaging 9.0 feet (NAVD 88) surrounding the West White Slough Unit. This dike is in poor

condition and recently breached during a high tide with no storm surge. The breach has been temporarily plugged with a water bladder.

- The low lying areas behind the dike average 3.0 feet (NAVD 88). The elevation of these low lying areas will be increased through the placement of sediment. These low lying areas will be restored to a graded salt marsh plain, starting at the dike and extending east to the Highway 101 road prism. The proposed salt marsh plain will help attenuate the erosive energy of wind generated waves and storm surge elevation.
- There will be no overall reduction in surface elevation to the west of Highway 101 with the salt marsh plain grading up to 9.0 feet (NAVD 88), the same elevation as the existing dike.

j) Expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?

Assessment: The Project will have no impact.

- The Project is located on diked former tidelands adjacent to Humboldt Bay located in a tsunami run-up zone.
- The Project will not expose people or structures that are not already exposed, to seiche, or tsunami; the Project will not result in mudflows.

IX. LAND USE AND PLANNING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?				X

Land Use and Planning

a. Physically divide an established community?

Threshold of Significance for this initial study: Physically divide an established community.

Assessment: The Project will have no impact on an established community as none exist at the site.

- The Project will not create a physical barrier that would limit access to an area that was previously accessible.

b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including, but not limited to the general plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating and environmental effect?

Threshold of Significance for this initial study: Failure to comply with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project.

Assessment: The Project will have no impact.

- In 2009, the Refuge prepared and adopted its Comprehensive Conservation Plan (CCP) which governs land use in the Refuge including the proposed Project to restore inter-tidal wetlands at the West Unit. This Project is consistent with the CCP, because the CCP calls for this project to be carried out.
- The Refuge will secure all necessary federal, state, and local authorizations prior to implementing this Project.

c. Conflict with any applicable habitat conservation plan or natural community conservation plan.

Threshold of Significance for this initial study: If the Projected is located in an area with an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan, is it inconsistent with the applicable Plan?

Assessment: The Project will have no impact.

- The Refuge has an approved CCP. The restoration of tidal wetlands at White Slough is an identified goal of the Refuge's CCP.
- The Project is designed to improve aquatic habitat conditions without adversely affecting any other species or their habitats.
- There are no Habitat Conservation Plans, Natural Community Conservation Plans, or other approved local, regional, or state habitat conservation plans covering the Project site.

X. MINERAL RESOURCES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the State?				X
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X

Mineral Resources

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

Threshold of Significance for this initial study: Development of land overlying a mineral resource that would physically preclude future access to that resource.

Assessment: The Project will have no impact on future availability of a mineral resource that would be of value to the region and the residents of the state.

- This Project is located on a federal wildlife Refuge. Mining of aggregate is not an allowable use in the Refuge.

b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Assessment: Not applicable to the Project as no such delineation exists for the Project area.

XI. NOISE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?		X		
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?			X	
c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?			X	
e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?				X
f) For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?				X

Noise

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Threshold of Significance for this initial study: Generating noise and exposing people to noise in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Assessment: The Project with mitigation measures will have a less than significant adverse effect on people exposed to noise levels in excess of established standards.

- The Project may temporarily generate noise at the work site that exceeds 85 db for a short-term when using heavy equipment.
- Workers in close proximity to operating equipment and equipment operators will be exposed to noise levels in excess of 85 db.
- There are three residences in the immediate vicinity, between 500-1,000 feet from the Project. Based on the rule of thumb that point sources of noise are attenuated by 6 db at 100 ft from the source and by an additional 6 db each time that distance is doubled, construction noise at the residences will be attenuated by distance by approximately 18 db, to a level of about 67 db. Additional attenuation from vegetation and uncompacted ground would be expected to reduce construction noise levels at the residences to approximately 60 db.
- The nearest College of the Redwoods building is located approximately 1,200 feet from the southernmost portion of the West Unit Project Area, and 3,000 feet from the northern portion of the West Unit. Construction noise at the nearest College of the Redwoods building would be attenuated by distance by approximately 24 db, to a level of approximately 61 db. Additional attenuation from vegetation and uncompacted ground would be expected to reduce construction noise levels at the residences to approximately 58 db.
- The Humboldt County Framework Plan Section 3240 addresses noise in residential areas with a standard that “the maximum acceptable exterior noise level for residences is 60 dB.” The same policy section, however, includes a table indicating that Ldn sound level up to 65 dB are “normally acceptable” in residential areas. Ldn is the average sound level in decibels, excluding frequencies beyond the range of the human ear, during a 24-hour period with a 10dB weighting applied to nighttime sound levels. The Framework Plan indicates that Ldn of up to 75 dB are normally acceptable in a livestock farming area, and up to 70 Ldn in a golf course.
- Existing noise sources in the project area are associated with traffic on area roads and on Highway 101. A 2002 survey of noise associated with Highway 101 at seven locations in Humboldt County found a Community Noise Equivalent Level (CNEL) ranging from 73-80 dB at a measurement distance of 11-30 feet (Charles Salter Associates 2002). CNEL is the average sound level over a 24 hour period, with a penalty of 5 dB added between 7 pm and 10 pm. and a penalty of 10 dB added for the nighttime hours of 10 pm to 7 am, since most citizens living in a given area are very sensitive to noise in the early morning hours and somewhat sensitive to noise during evening hours. When Project construction noise is added to the sound levels generated by traffic on Highway 101, the result would be an increase of ~3 dB, which is at the threshold of perception.

11 (a) Mitigation Measures:

1. Workers will be required to wear hearing protection when in the vicinity of or while operating equipment producing noise levels equal to or greater than 85 db.

2. Restrict noise from earthmoving and hauling of soils

Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 7:00 a.m. to 7:00 p.m. and weekends and holidays from 9:00 a.m. to 6:00 p.m. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific. If sediment is transported from Samoa, it may be necessary to haul material after 7:00 p.m. or before 7:00 a.m. to minimize traffic impacts. Hauling outside of the designated hours above will be minimized to the extent feasible.

All equipment shall operate with factory-equipped mufflers, and staging areas shall be located as far from residential uses as is practical. These conditions shall be incorporated into project contract specifications.

A haul-truck route plan shall be developed. Hauling shall minimize passing any substantial collection of noise-sensitive land uses (i.e. occupied houses, schools, hospitals).

Larger capacity belly and end-dump trucks as well as double-trailers shall be used whenever feasible to minimize the number of truck trips necessary.

Construction personnel shall conduct all work activities in a manner that minimizes noise generation. A variety of contractor actions are available that will reduce construction noise, including: i) turning off engines on all construction equipment not in active use, ii) shielding noisy equipment with less noisy equipment, and iii) avoiding high RPM engine operation whenever possible.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

Assessment: The Project will have a less than significant impact on people from excessive groundborne vibration or groundborne noise levels; any groundborne vibration or noise will be short-term and will be mitigated to a less than significant level by mitigation measures specified in 11a.

c) A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Assessment: The Project will have no permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project, because the Project will be of short-term duration.

d) A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project?

Assessment: The Project will have a less than significant adverse effect on ambient noise levels in the Project vicinity.

- The Project will involve only one or two pieces of vehicular equipment operating at the same and only for short-term duration.
- Back-up beepers on heavy equipment vehicles will cause temporary noise in excess of ambient levels during daylight hours, but the Project is of short duration and this noise increase is not considered substantial.
- Construction activities are scheduled during the period when nesting and breeding sites species of concern are vacant.
- Increases in ambient noise levels will be kept to a less than significant level by implementation of mitigation measures in Section 11a.

e) For a Project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the Project expose people residing or working in the Project area to excessive noise levels?

Assessment: Not applicable to this Project as the work site is not located within two miles of a public airport.

f) For a Project within the vicinity of a private airstrip, would the Project expose people residing or working in the Project area to excessive noise levels?

Assessment: Not applicable. The Project work site is not located within two miles of a public airport.

XII. POPULATION AND HOUSING	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X

Population and Housing

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

Threshold of Significance: Result in substantial population growth in the area.

Assessment: No impact and not applicable. The Project is limited to restoring tidal wetlands and it will not induce substantial population growth in an area and it does not involve construction of housing or growth inducing infrastructure.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?

Threshold of Significance: Displace significant housing units in the area.

Assessment: No impact, not applicable, the Project is limited to restoring tidal wetlands and will not displace any existing housing.

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Threshold of Significance: Displace a significant number of people.

Assessment: No impact and not applicable. The Project is limited to estuary enhancement and tidal marsh restoration and will not displace any people.

XIII. PUBLIC SERVICES

Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?	X
Police protection?	X
Schools?	X
Parks?	X
Other public facilities?	X

Public Services

a) Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Threshold of Significance: Result in increased need for public services such as fire and police protection, schools, and parks.

Assessment: No impact and not applicable. The Project is limited to tidal marsh restoration and will not require the Refuge to provide any public services that are not already planned for in its 2009 Comprehensive Conservation Plan. The proposed Project would have no impact by creating a need for new or physically altered facilities for fire protection, police protection, schools, parks, nor other public facilities

XIV. RECREATION	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?				X
b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

Recreation

a) Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Threshold of Significance: Increased use of parks or other recreational facilities in the area.

Assessment: No impact and not applicable. The Project is limited to tidal marsh restoration on a federal wildlife refuge.

- The proposed Project will not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- The proposed Project will enhance estuary habitat and restore salt marsh habitat and will not alter human use or facilities at existing parks or recreational facilities.

b) Does the Project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Threshold of Significance: Requires the construction or expansion of recreational facilities in the area.

Assessment: No impact and not applicable, the Project is limited to tidal marsh restoration and does not include recreational facilities or require/influence the Refuge to

expand or construct recreational facilities such as trails, visitor center, parking, and restrooms. The Refuge currently has such facilities with adequate capacity for expected future visitor use in the Project area.

XV. TRANSPORTATION/TRAFFIC Would the Project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?			X	
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?				X
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?				X
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?				X
g) Conflict with adopted policies plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X

Transportation

a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

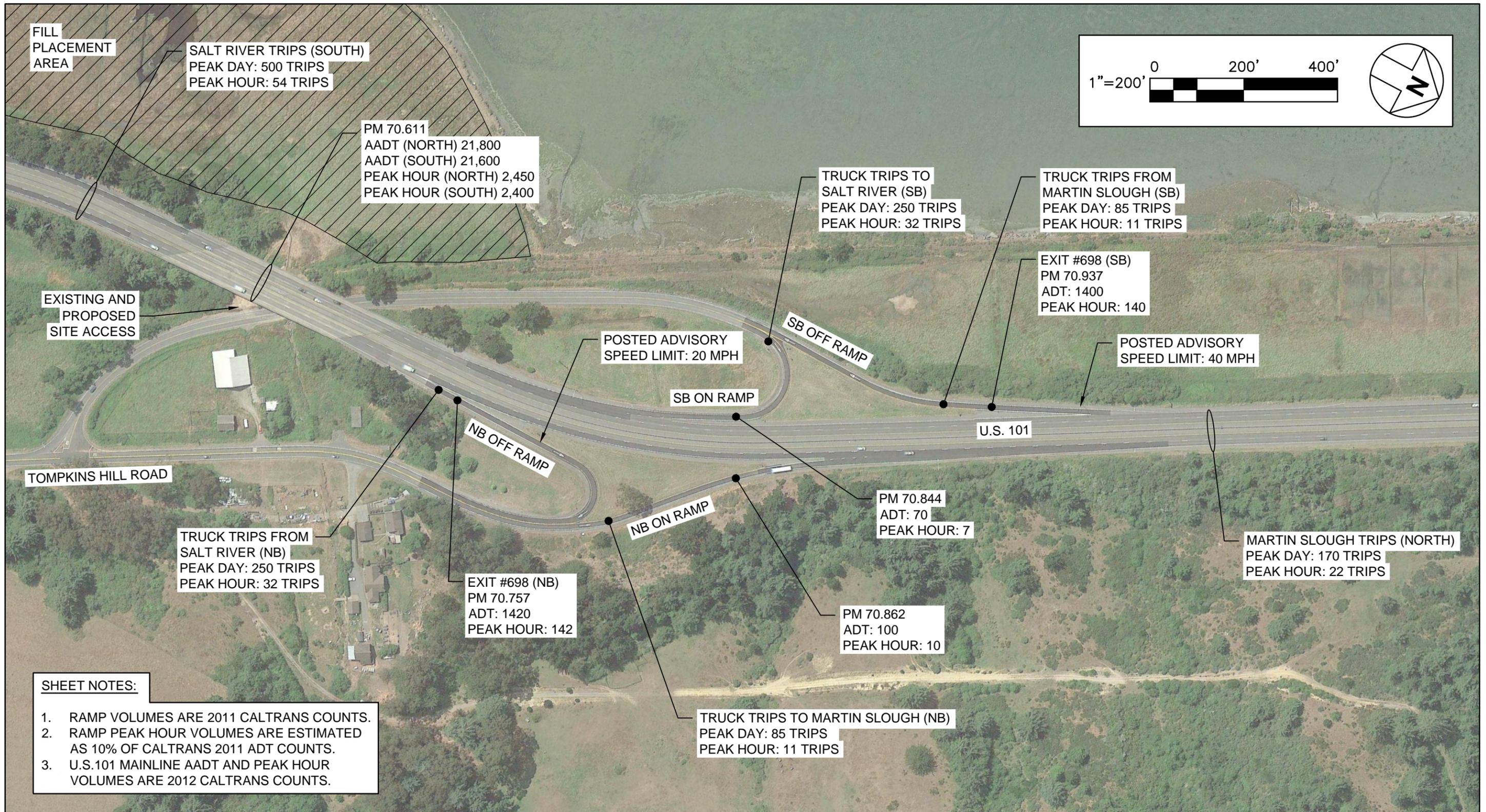
Threshold of Significance: Substantial increase in the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections.

Assessment: The Project will have a less than significant impact on the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections. It will not increase traffic over the long term as it is limited to tidal marsh restoration. During project implementation, there will be an increase in truck traffic associated with delivery of fill material. The sources of fill material for the project have not yet been determined. Potential sources include the Martin Slough Enhancement Project (MSEP), located approximately five miles north of the Project Area, the Salt River Enhancement Project (SRERP), located near Ferndale, approximately 10 miles southwest of the Project Area, sediment from a development project at the Bear River Casino, located approximately 7 miles from the Project Area, and dredging projects at the Woodley Island Marina, the Eureka Marina, and the Humboldt Bay Power Plant. Material from dredging projects could be transported by pumping through a temporary pipeline to the project vicinity (e.g. Fields Landing), where material could be stockpiled for dewatering. Because the source of fill material for this project has not been determined, the analysis of impacts from transportation of fill material is limited in its detail. However, the impact of transporting a large volume of material from the SRERP and the MSEP is assessed. Sediment from these two sources is likely to constitute more than half the sediment for the project. Because the SRERP is located further from the Project Area than any other likely source of sediment for the project, potential impacts from transporting material from other sites are likely to be less significant than those discussed here.

Existing Traffic Conditions

Existing traffic volumes for U.S. 101 and the on/off ramps at the Fields Landing Interchange (#698) were obtained from the Caltrans Traffic Data Branch website at <http://traffic-counts.dot.ca.gov/>. Mainline U.S. 101 Annual Average Daily Traffic (AADT) and Peak Hour volumes were obtained from the 2012 Traffic Volumes Book, and were collected in 2012. Average Daily Traffic (ADT) and Peak Hour ramp volumes were obtained from the 2012 Ramp Volumes Book and were collected in 2011. These traffic volumes are summarized on Figure 7. Peak hour ramp volumes are estimated as 10% of the ADT volumes. The off-ramp volumes, which are significantly higher than the on-ramp volumes, are associated with AM peak hour student commuter trips to College of the Redwoods. It is believed the on-ramp volumes are lower because student return trips are more distributed throughout the day depending on when classes end.

Table 3 summarizes the estimated number of truck trips from the MSEP site to the White Slough project site.



Note that truck trips are estimated based on transport of larger volumes of sediment than anticipated by the current design. Refer to the text for truck trip estimates based on current design.

U.S. FISH & WILDLIFE SERVICE
WHITE SLOUGH RESTORATION PROJECT
TRAFFIC CONTROL PLAN
EXISTING TRAFFIC VOLUMES AND TRIP ESTIMATES

Figure 7

Table 3. Martin Slough Phase I Project Trip Estimate

<i>Parameter</i>	<i>Value</i>	<i>Units</i>
Construction Period	90	Days
Work Day	8	Hrs
Excavation Volume	76,000	CY
Truck capacity	13	CY
Hauled Per Day	1,100	CY
Exiting Truck Trips Per Day (peak)	85	trips
Entering Truck Trips Per Day (peak)	85	trips
Total Daily Truck Trips (Peak)	170	trips
Total Truck Trips per hour (Peak)	22	trips

The existing AADT and Peak Hour traffic volumes on U.S. 101 mainline and ramps at the Fields Landing Interchange (#698) are shown on Figure 7. Table 4 summarizes the temporary increase in traffic on U.S. 101 mainline and ramps associated with the additional truck trips from the Martin Slough project.

Table 4. U.S. 101 and Ramp Volume Increases from Martin Slough Project Trips at Fields Landing Interchange (#698)

Location	Volume Change
U.S. 101 North AADT	+0.8%
U.S. 101 North Peak Hour	+0.9%
SB Off-Ramp ADT	+6.1%
SB Off-Ramp Peak Hour	+7.9%
NB On-Ramp ADT	+85%
NB On-Ramp Peak Hour	+110%

The temporary increase in traffic on U.S. 101 mainline south of the Fields Landing Interchange is not significant and is not anticipated to have impacts on existing freeway operations. The temporary increase in traffic on the SB off-ramp and NB on-ramp at the U.S. 101 the Fields Landing Interchange is significant. However, the existing ramp volumes are low, and will remain low with the additional temporary truck trips. Therefore, total ramp volumes with truck trips are not considerable and the additional truck trips are not anticipated to have impacts to existing on-ramp and off-ramp operations.

Another anticipated source of material is from the SRERP, which is located off of Port Kenyon Road near Ferndale, CA. Table 5 summarizes the estimated number of truck trips from this project site to the White Slough project site.

Table 5. SRERP Project Trip Estimate

<i>Parameter</i>	<i>Value</i>	<i>Units</i>
Construction Period	90	Days
Work Day	8	Hrs
Excavation Volume	125,000	CY
Truck capacity	13	CY
Hauled Per Day (maximum)	1,400	CY
Exiting Truck Trips Per Day (peak)	108	trips
Entering Truck Trips Per Day (peak)	108	trips
Total Daily Truck Trips (Peak)	216	trips
Total Truck Trips per hour (Peak)	27	trips

The existing AADT and Peak Hour traffic volumes on U.S. 101 mainline and ramps at the Fields Landing Interchange (#698) are shown on Figure 7. Table 6 summarizes the temporary increase in traffic on U.S. 101 mainline and ramps associated with the additional truck trips from the Salt River project.

Table 6. U.S. 101 and Ramp Volume Increases from SRERP Trips at Fields Landing Interchange (#698)

Location	Volume Change
U.S. 101 South AADT	+1.0%
U.S. 101 South Peak Hour	+1.1%
NB Off-Ramp ADT	+7.6%
NB Off-Ramp Peak Hour	+9.7%
SB On-Ramp ADT	+191.9%
SB On-Ramp Peak Hour	+149.9%

The temporary increase in traffic on U.S. 101 mainline south of the Fields Landing Interchange is not significant and is not anticipated to have impacts on existing freeway operations. The temporary increase in traffic on the northbound (NB) off-ramp and southbound (SB) on-ramp at the U.S. 101 Fields Landing Interchange is significant. However, the existing ramp volumes are low, and will remain low with the additional temporary truck trips. Therefore, total ramp volumes with truck trips are not considerable and the additional truck trips are not anticipated to have impacts to existing on-ramp and off-ramp operations.

Truck Haul Routes

Material delivered to the White Slough site from the Martin Slough project and SRERP sites would be hauled using the routes shown on Figure 8. The majority of the haul distance from both sites would be on U.S. 101.

Traffic Control Plan

A traffic control plan has been prepared for the project and is shown on Figure 9. The temporary traffic control measures were developed based on Part 6, “Temporary Traffic Control” of the 2012 Edition of the California Manual on Uniform Traffic Control Devices (MUTCD). The White Slough site access is through a gate located on the two-



NOT TO SCALE

HERRICK AVE INTERCHANGE #702

MARTIN SLOUGH PROJECT SITE

Humboldt Hill

FIELDS LANDING INTERCHANGE #698

WHITE SLOUGH PROJECT SITE ENTRANCE/EXIT (SEE FIGURES 1 AND 2)

LEGEND

- SALT RIVER PROJECT HAUL ROUTE
- MARTIN SLOUGH PROJECT HAUL ROUTE

Loleta

101
345

SINGLY HILL RD/SR 211 INTERCHANGE #692

SALT RIVER PROJECT SITE

211

Fortuna

Riverside Rd
Main Street
Port Kenyon Rd
Main St

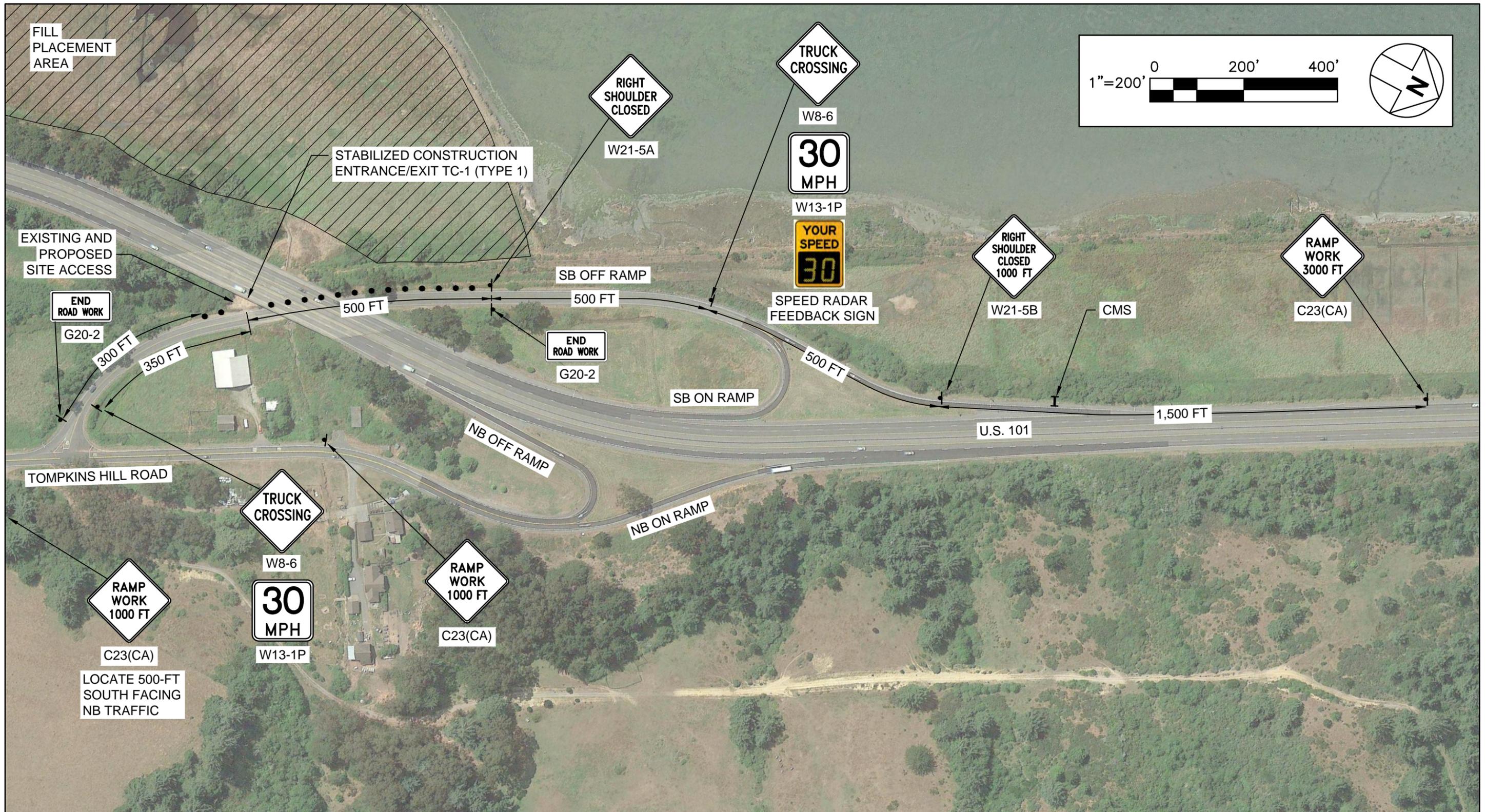


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U.S. FISH & WILDLIFE SERVICE
WHITE SLOUGH RESTORATION PROJECT
TRAFFIC CONTROL PLAN
PROPOSED HAUL ROUTES

Job Number 8410410
Revision 1
Date JAN 2015

Figure 8



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LEGEND:

- CHANNELIZING DEVICE
- ↓ SIGN (SHOWN FACING RIGHT)
- I CHANGEABLE MESSAGE SIGN (CMS)

**U.S. FISH & WILDLIFE SERVICE
WHITE SLOUGH RESTORATION PROJECT**

**TRAFFIC CONTROL PLAN
SIGN PLACEMENT AND LAYOUT**

Job Number | 8410410
Revision | 1
Date | JAN 2015

Figure 9

way segment of the SB on and off-ramps under the U.S. 101 Fields Landing overcrossing structure. Figure 10 shows an image of the proposed site access. As indicated on Figure 10, the access from the shoulder a distance of approximately 75-100 feet would be stabilized per TC-1 (Type 1) of the Caltrans Storm Water Quality Handbooks, Construction Site Best Management Practices Manual, Section 6 (March 2003).

b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Assessment: The Project will not exceed any level of service standard as it is limited to tidal marsh restoration. Delivery of equipment and workers to the Project site will involve a negligible number of traffic trips during a short period of time. All excavated materials will be utilized on site with no travel necessary on public roads.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

Assessment: Not applicable, the Project is limited to tidal marsh restoration.

d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Assessment: Not applicable, the Project is limited to tidal marsh restoration.

e) Result in inadequate emergency access?

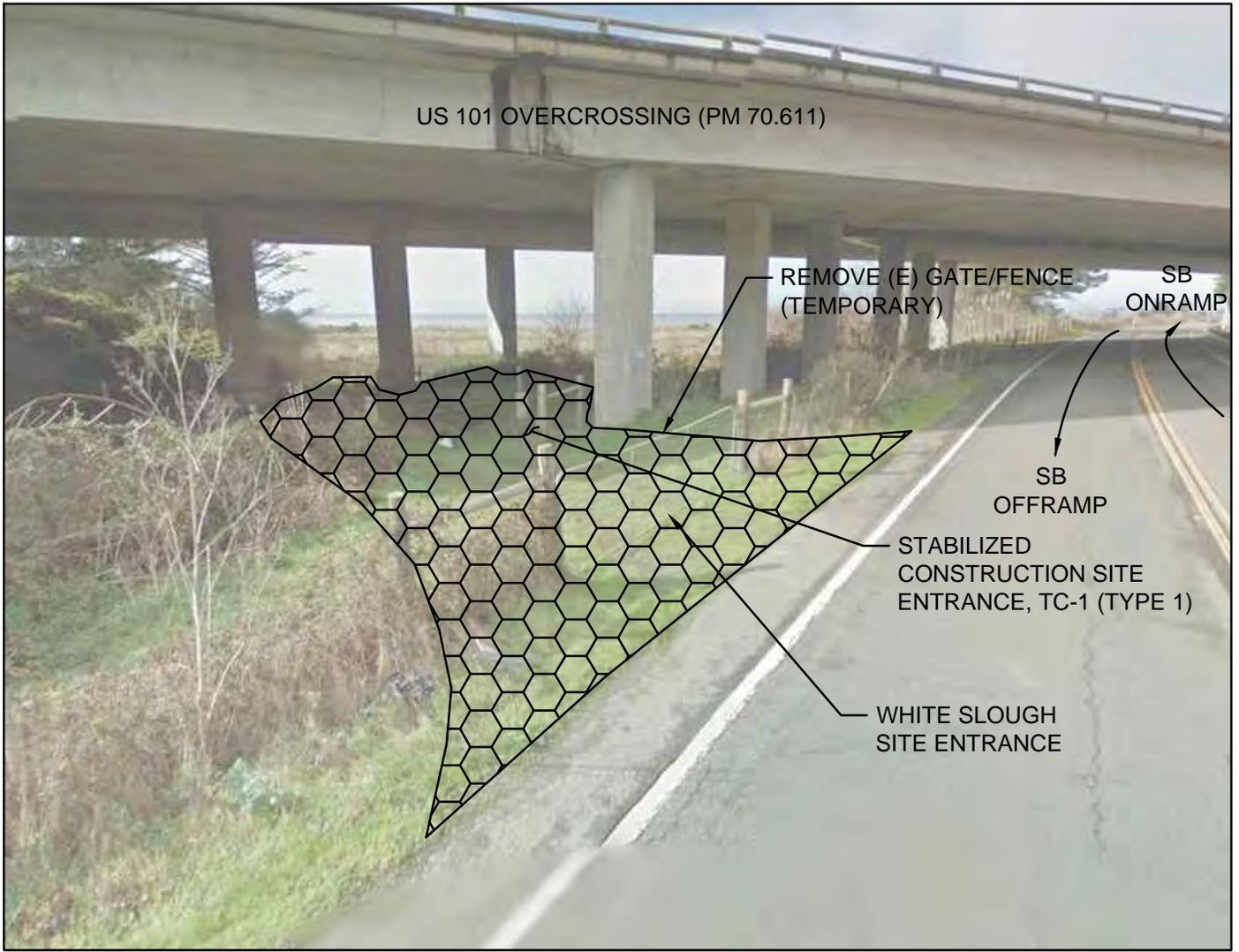
Assessment: Not applicable, the Project is limited to tidal marsh restoration.

f) Result in inadequate parking capacity?

Assessment: The Project will not be expanding the Refuge; it is limited to wetland restoration and enhancement. The Project is not expected to cause an increase in the number of visitors to the Refuge. The Refuge currently has adequate parking capacity for its visitors.

g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Assessment: Not applicable, the Project is limited to tidal marsh restoration.



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U.S. FISH & WILDLIFE SERVICE
WHITE SLOUGH RESTORATION PROJECT
TRAFFIC CONTROL PLAN
PROPOSED WHITE SLOUGH SITE ACCESS

Job Number 8410410
Revision 1
Date JAN 2015

Figure 10

XVI. UTILITIES AND SERVICE SYSTEMS	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the Project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Projects projected demand in addition to the providers existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the Projects solid waste disposal needs?				X
g) Comply with federal, State, and local statutes and regulations related to solid waste?				X

Utilities and Service Systems

- a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Assessment: No impact. The Project will not produce wastewater; it is limited to tidal marsh restoration.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Assessment: No impact. The Project will not produce wastewater; it is limited to tidal marsh restoration.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Assessment: No impact. Not applicable, the Project is limited to tidal marsh restoration.

d) Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed?

Assessment: No impact. The Project currently has sufficient water supplies available to implement tidal marsh restoration.

- If diversion of surface flow or groundwater withdrawal upstream of the Refuge were to increase it may adversely affect aquatic habitat on the Refuge; including the Project. However, currently there is sufficient stream flow to allow successful habitat enhancement and restoration.

e) Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project's projected demand in addition to the provider's existing commitments?

Assessment: No impact. The Project will not produce wastewater; it is limited to tidal marsh restoration.

f) Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs?

Assessment: No impact. The Project will not generate solid waste; it is limited to tidal marsh restoration.

g) Comply with federal, state, and local statutes and regulations related to solid waste?

Assessment: No impact. The Project will not generate solid waste; it is limited to tidal marsh restoration.

XVII. MANDATORY FINDINGS OF SIGNIFICANCE	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?			X	
c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly			X	

Mandatory Findings of Significance

Section 15065 of the “CEQA Guidelines,” which are found in Title 14 of the California Code of Regulations, requires the lead agency to determine whether the proposed Project may have a significant effect on the environment, which would require the preparation of an Environmental Impact Report.

a) Does the Project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, “substantially” reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of

California history or prehistory?

Threshold of Significance for this initial study: The Project has impacts associated with any of the environmental topics identified in the Appendix G of the CEQA Guidelines that cannot be mitigated to less than significant levels.

Assessment: The Project will have less than a significant impact on the environment with the successful implementation of mitigation measures.

- The Project will not degrade the quality of the environment. Refer to previous discussions of less than significant impact with mitigation measure assessments and/or mitigation measures in this initial study: Section IV(a) state and federal protected species, (b) riparian or sensitive natural community, (c) state or federally protected waters and wetlands, ; Section VIII (a) water quality; and XI (a) noise levels.
- Overall this Project will provide a long-term benefit to the environment as it will restore a tidal marsh complex including a tidal channel network and tidal ponds, greatly increasing aquatic and wetland habitat diversity relative to the existing condition, which consists solely of degraded brackish marsh. The Project Area is currently separated from the Bay by dikes that are in disrepair and threatened with imminent failure. If the Project is not implemented, the Project Area is likely to convert to mudflat within the next several years after the dikes fail.
- The Project will provide long-term benefits to resident and migratory fish, wildlife and waterfowl. By increasing the elevation of the project area, enhancing the structural complexity of tidal marshes and increasing channel network complexity and connectivity, the Project will improve the landscape capacity to adjust to midrange predictions of sea level rise.

b) Does the Project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a Project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Threshold of Significance for this initial study: The incremental effects of a Project are cumulatively considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.

Assessment: The Project will have a less than significant cumulative impact.

- The Project does not have adverse impacts that are individually limited, but cumulatively considerable. It is the goal of the Project that the beneficial effects of tidal marsh restoration and habitat enhancement will be cumulative over time.

c) Does the Project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Threshold of Significance for this initial study: The Project will have a significant environmental impact on human beings, either directly or indirectly that cannot be mitigated to less than significant.

Assessment: The Project will have a less than significant impact, with the successful implementation of mitigation measures on human beings, either directly or indirectly.

- Refer to earlier assessments in initial study: Sections VIII (a) water quality and XI (a) noise levels.
- The habitat enhancement and restoration actions implemented as part of this Project will be beneficial to human beings.

Mitigation Measures

Biological Resources: 4 (a-c):

1. Construction will only occur between July 1st and October 31st when freshwater discharge from Chisum Creek is at its lowest and when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction.
2. Installation of temporary block nets or fish screens in the tidal channels and Chisum Creek will occur prior to all diversions or dewatering of any wetted channels, where work is to occur, to isolate and facilitate relocating any fish or amphibians. Relocation of fish and amphibians using electrofishing, seines, and dipnets will be coordinated with DFW, Refuge, NMFS, and USFWS staff as appropriate. During, and immediately after de-watering an authorized fish biologist will conduct a survey of the areas being de-watered for stranded fish or amphibians. Any stranded fish or amphibians shall be collected, recorded, and relocated to adjacent waters with appropriate habitat conditions.
3. Aquatic habitat will be de-watered for the shortest time necessary to complete construction or excavation. Pumps used to de-water work areas will utilize a fish screen on the inlet of sufficiently sized mesh to prevent entrainment of TWG or salmonids.
4. Construction activities in the seasonal wetlands in the West Unit Area will occur only when the area is dry and when adult red-legged frogs are not expected to be present.
5. Northwestern pond turtle surveys will be carried out by a qualified biologist along stream or pond margins two weeks prior to commencement of ground disturbing activities. Surveys will be utilized to locate and flag northwestern pond turtle nests with eggs, or to remove hatchlings and adults that may be present in the stream reach above the existing tidal zone. Any active nests located will left undisturbed until hatchlings have emerged or have been relocated to suitable areas outside of the area of disturbance, similarly relocation of any adults found will occur.
6. Surveys by a qualified biologist for nesting birds in riparian areas and 1,000 feet beyond the limits of disturbance, will occur two weeks prior to commencement of ground- disturbing activities. If breeding is confirmed of any birds of special status, construction activities that would degrade or remove breeding habitat will not occur in the immediate vicinity until the end of the breeding period for that species or until the breeding effort has either been determined to have failed or the young have been determined to have fledged.
7. A qualified botanist will survey for the 9 plant species of concern in the Project Area. If such plants are found, populations will be mapped and flagged, and avoided if possible. If populations of these plants cannot be avoided during excavation or grading they will be removed as “wafers” (top 12 inches of vegetation/topsoil) and

either transplanted immediately or stored separately on pond liners. These soils will be kept moist until they are re-placed at the appropriate finished grade and in the same orientation, or transplanted to another area of suitable habitat on the Refuge.

8. Disturbance of perennial wetlands, riparian vegetation, and open water habitats shall not exceed the minimum necessary to complete construction activities.
9. Vegetative disturbance will be contained within the limits of grading and kept to a minimum area.
10. To minimize disturbances to the existing marsh, work will be phased as described in the Project Description. If required, dewatering will be performed to limit work to dry areas. Construction best management practices will be followed to prevent sediment entering open waterways.

Hazards and Hazardous Materials 7 (a & h):

1. Heavy equipment that will be used in the Project will be in good condition and will be inspected for leakage of coolant and petroleum products and repaired, if necessary, before work is started.
2. Equipment operators will be trained in the procedures to be taken should an accident occur.
3. Prior to the onset of work the contractor will prepare a plan for the prompt and effective response to any accidental spills.
4. Absorbent materials designed for spill containment and cleanup will be kept at that Project site for use in case of an accidental spill.
5. Stationary equipment will be positioned over drip pans.
6. All internal combustion engines shall be fitted with spark arrestors.
7. The contractor shall have appropriate fire extinguishers and fire fighting tools present at all times when there is a risk of fire.
8. Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.

Hydrology and Water Quality 8 (a):

1. Construction will only occur between July 1st and October 31st when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction and when there is very little freshwater flowing in Chisum Creek. Excavated materials shall not be stockpiled overwinter. Sediment control measures shall be in place while materials are being stockpiled to minimize sediment and pollutant transport from the Project site.

2. Placement of fill in the Project Area will occur when the area is not inundated by tide water.
3. Excavation shall include handling of saturated soils. Saturated soils shall be dewatered and/or transported saturated in a manner that prevents excess discharge or spillage of soils or water within the construction access areas. A silt fence will be installed around the perimeter of temporary stockpiles of saturated soils to prevent runoff from leaving the site.
4. During construction a silt fence will be deployed to isolate work areas from existing channels, and to trap suspended sediment that might leave the construction site if stormwater runoff were to occur. If the silt fence is not adequately containing sediment, the construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below.
5. No construction materials, debris, or waste, shall be placed or stored where it may be allowed to enter into or be placed where it may be washed by rainfall into waters of the U.S./State.
6. Following completion of excavation, placement of fill, and grading all ground to the limits of disturbance (except newly constructed streambeds, pond beds, and tidally inundated areas) shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Treated areas not exposed to tidal influence will be mulched with at least 2 to 4 inches of certified weed-free straw mulch with wheat or other straw for riparian and wetland areas and rice straw for uplands and use of a seed mix with coverage equivalent to 100 lbs/acre of barley seed and appropriate riparian vegetation for immediate erosion control. No annual (Italian) ryegrass (*Lolium multiflorum*) shall be used. In places such as stream banks, rush mattresses will be installed for immediate erosion control.
7. All temporary fill, synthetic mats and silt fences will be removed from wetlands and waters of the U.S./State immediately on cessation of construction. Biodegradable geotextile fabrics will be used, where possible.
8. Soil and material stockpiles shall be properly protected to minimize sediment and pollutant transport from the construction site.
9. The following BMPs shall be implemented to prevent entry of storm water runoff into the excavation site, the entrainment of excavated contaminated materials leaving the site, and to prevent the entry of polluted storm water runoff into coastal waters during the transportation and storage of excavated contaminated materials:
 - EC-2 Preservation of Existing Vegetation
 - EC-6 Straw Mulch
 - EC-7 Geotextile and Mats
 - EC-9 Earth Dikes and Drainage Swales
 - EC-10 Velocity Dissipation Devices

SE-1 Silt Fence
NS-2 Dewatering Operations
NS-4 Temporary Stream Crossing
NS-5 Clear Water Diversion
WM-9 Sanitary/Septic Waste Management

10. Stream diversion and dewatering shall conform to the following BMP
NS-2 Dewatering Operations
NS-5 Clear Water Diversion
EC-9 Earth Dikes and Drainage Swales
EC-10 Velocity Dissipation Devices

Noise 11 (a):

1. Workers will be required to wear hearing protection when in the vicinity of or while operating equipment producing noise levels equal to or greater than 85 db.

2. Restrict noise from earthmoving and hauling of soils

Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 7:00 a.m. to 7:00 p.m. and weekends and holidays from 9:00 a.m. to 6:00 p.m. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific. If sediment is transported from Samoa, it may be necessary to haul material after 7:00 p.m. or before 7:00 a.m. to minimize traffic impacts. Hauling outside of the designated hours above will be minimized to the extent feasible.

All equipment shall operate with factory-equipped mufflers, and staging areas shall be located as far from residential uses as is practical. These conditions shall be incorporated into project contract specifications.

A haul-truck route plan shall be developed. Hauling shall minimize passing any substantial collection of noise-sensitive land uses (i.e. occupied houses, schools, hospitals).

Larger capacity belly and end-dump trucks as well as double-trailers shall be used whenever feasible to minimize the number of truck trips necessary.

Construction personnel shall conduct all work activities in a manner that minimizes noise generation. A variety of contractor actions are available that will reduce construction noise, including: i) turning off engines on all construction equipment not in active use, ii) shielding noisy equipment with less noisy equipment, and iii) avoiding high RPM engine operation whenever possible.

Mandatory Findings of Significance XVII (a & c):

- Section IV (a) state and federal protected species, (b) riparian or sensitive natural community, (c) state or federally protected waters and wetlands, ; Section VIII (a) water quality; and XI (a) noise levels.
- Sections VIII (a) water quality and XI (a) noise levels.

References

- California Stormwater Quality Association. 2004. Stormwater Best Management Practice (BMP) Handbook.
- Chamberlain, Charles, D. 2005. Presentation to SACER meeting on Tide Water Goby, December 9, 2005. USFWS, Arcata, CA.
- Cole, M.E. 2004. Distribution of fish species in Humboldt Bay, Humboldt County, California, USA: A GIS Perspective. Master's thesis, Humboldt State University, Arcata, CA.
- Crooks, S. 2009. Carbon Sequestration in Tidal Wetlands: White Paper. Report by PWA to the Resources Legacy Fund, PWA Reference 1944.
- Hunter, John E., 2005. Atlas of the Breeding Birds of Humboldt County, California.
- Komar, James. Personal Communication. Email to Joel Gerwein, State Coastal Conservancy Project Manager on 4/4/2014.
- Loud, Llewellyn L., 1918. Ethnogeography and Archaeology of the Wiyot Territory. University of California Publications in American Archaeology and Ethnology, Vol. 14, No.3. December 1918.
- McGourty, Katie. 2005. Presentation to SACER meeting on Tide Water Goby, December 9, 2005. Humboldt State University, Arcata, CA.
- McLaughlin, J. and F. Harradine. 1965. Soils of western Humboldt County. Department of Soils and Plant Nutrition, University of California, Davis.
- Moyle, P. M. 2002. Inland fishes of California. University of California Press, Berkeley, CA
- Pacific Watershed Associates, 2009. Geologic Evaluation of the Upstream Portion of the White Slough Restoration Project, Humboldt County. Tom Leroy. California, Pacific Watershed Associates, Arcata, CA.
- Philip Williams and Associates. 2009. Greenhouse Gas Mitigation Typology Issues Paper: Tidal Wetlands Restoration. California Climate Action Registry. February 2009.
- Pickart, Andrea. 2006. Generalized Vegetation Map White Slough Unit. U.S.F.W.S., Arcata, CA.
- Pickart, Andrea. 2006. Correspondence regarding the presence of rare salt marsh plants at the White Slough Unit. U.S.F.W.S., Arcata, CA.
- Raymond, Anan W., 1990. Cultural Resource Survey at Humboldt Bay National Wildlife Refuge Humboldt County, California. USFWS Portland, Oregon.

Schlosser, S. and A. Eicher. 2012. The Humboldt Bay and Eel River Estuary Benthic Habitat Project. California Sea Grant Publication T-075. 246 p. Available: <http://ca-sgep.ucsd.edu/humboldthabitats>

USFWS, 2002. Recovery Plan for the California Red-Legged Frog (*Rana aurora draytonii*).

USFWS, 2005. Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*).

USFWS, 2009. Humboldt Bay National Wildlife Refuge Complex, Draft Comprehensive Conservation Plan, Environmental Assessment, and Appendices.

Van Hattem, Michael, 2010. Off-channel Habitat Recommendations and the American Bullfrog, California Department of Fish and Game, Eureka, CA.

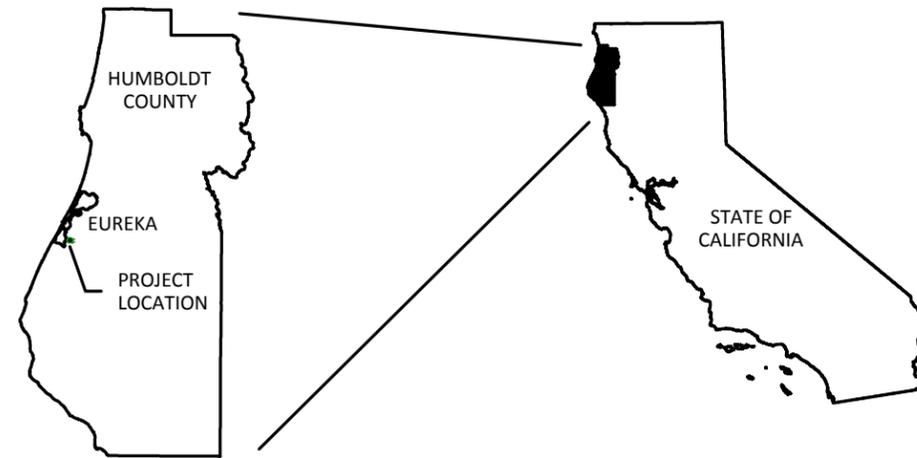
Van Hattem, Michael, 2010. Personal communication. California Department of Fish and Game, Arcata, CA.

Whittlesey, R., M. Brush, and S. Holler. 2013. Salt Marsh Carbon Sequestration: A Baseline Study. City of Arcata, CA. Unpublished paper prepared for Environmental Science 410: Environmental Science Capstone/Practicum, December 16, 2013. Available: <http://www2.humboldt.edu/sustainability/node/183>

Appendix 1. 50% Project Concept Plans



WHITE SLOUGH PROJECT AREA
GENERAL LOCATION MAP
SOURCE: USGS 7-1/2' QUADRANGLE MAP
FIELD'S LANDING, CA



PROJECT LOCATION
(N.T.S.)

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4	WEST WHITE SLOUGH PROJECT AREA EXISTING TOPOGRAPHY
5	WHITE SLOUGH TIDAL DATUMS
6	WEST WHITE SLOUGH PROJECT AREA PHASE I: TIDAL RIDGE ALIGNMENTS AND TYPICAL SECTION
7	WEST WHITE SLOUGH PROJECT AREA PHASE I: WORK: PROPOSED TOPOGRAPHY WITH CONSTRUCTED TIDAL RIDGES
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WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
HUMBOLDT BAY NATIONAL WILDLIFE REFUGE
LOLETA, CA

50% CONCEPT PLANS - 1/22/2015

(NOT FOR CONSTRUCTION)

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ARCATA, CA 95519
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PREPARED FOR:
HUMBOLDT BAY
NATIONAL WILDLIFE
REFUGE COMPLEX
LOLETA, CA



WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
50% CONCEPT PLANS

TITLE SHEET AND LOCATION

DESIGNED BY:
DVD/CCS

DRAWN BY:
CCS/DVD

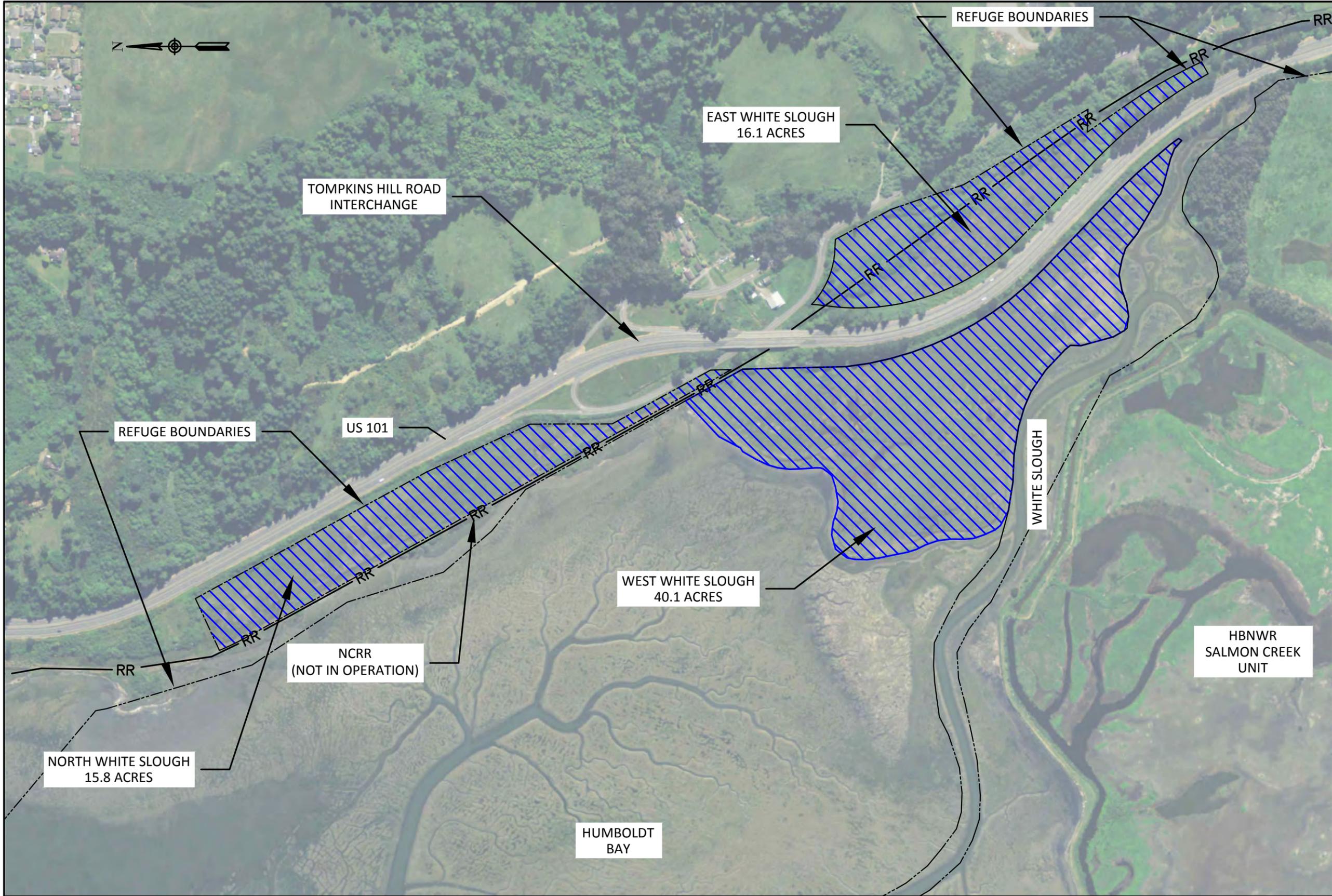
APPROVED BY:
CCS

DATE:
1/22/2015

SHEET NUMBER:
1

SCALE:
AS INDICATED

NOTES:



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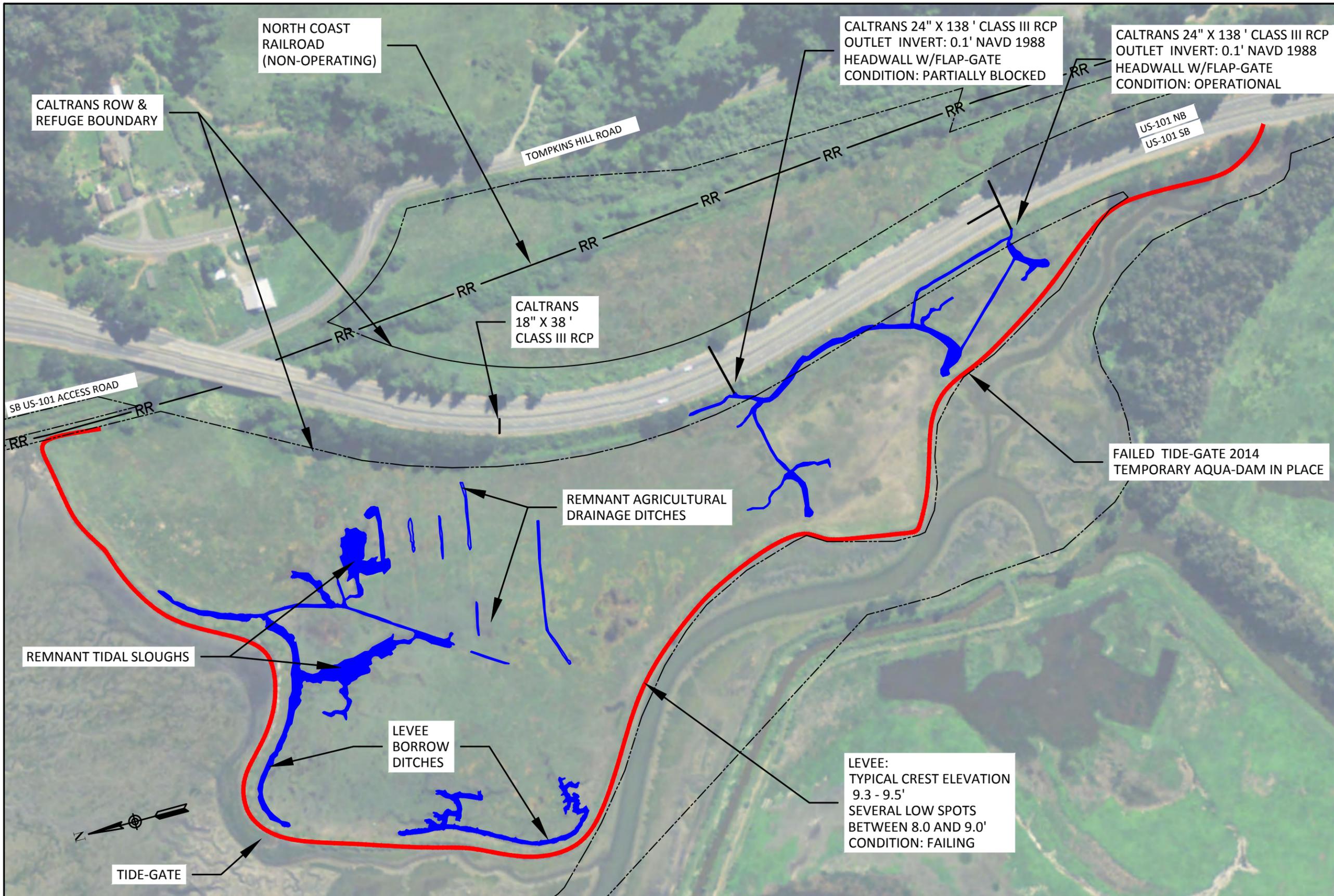


WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

HUMBOLDT BAY NATIONAL WILDLIFE REFUGE
 WHITE SLOUGH UNIT - GENERAL FEATURES

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) REFUGE BOUNDARIES FROM USGS NATIONAL BOUNDARY DATASET (NBD) FOR CALIFORNIA
 4/1/2014.

DESIGNED BY: DVD/CCS	DRAWN BY: CCS/DVD	APPROVED BY: CCS	DATE: 1/22/2015	SHEET NUMBER: 2
SCALE:				0 500'



CALTRANS ROW & REFUGE BOUNDARY

NORTH COAST RAILROAD (NON-OPERATING)

TOMPKINS HILL ROAD

CALTRANS 24" X 138' CLASS III RCP OUTLET INVERT: 0.1' NAVD 1988 HEADWALL W/FLAP-GATE CONDITION: PARTIALLY BLOCKED

CALTRANS 24" X 138' CLASS III RCP OUTLET INVERT: 0.1' NAVD 1988 HEADWALL W/FLAP-GATE CONDITION: OPERATIONAL

CALTRANS 18" X 38' CLASS III RCP

US-101 NB
US-101 SB

SB US-101 ACCESS ROAD

FAILED TIDE-GATE 2014
TEMPORARY AQUA-DAM IN PLACE

REMNANT AGRICULTURAL DRAINAGE DITCHES

REMNANT TIDAL SLOUGHS

LEVEE BORROW DITCHES

LEVEE:
TYPICAL CREST ELEVATION 9.3 - 9.5'
SEVERAL LOW SPOTS BETWEEN 8.0 AND 9.0'
CONDITION: FAILING

TIDE-GATE

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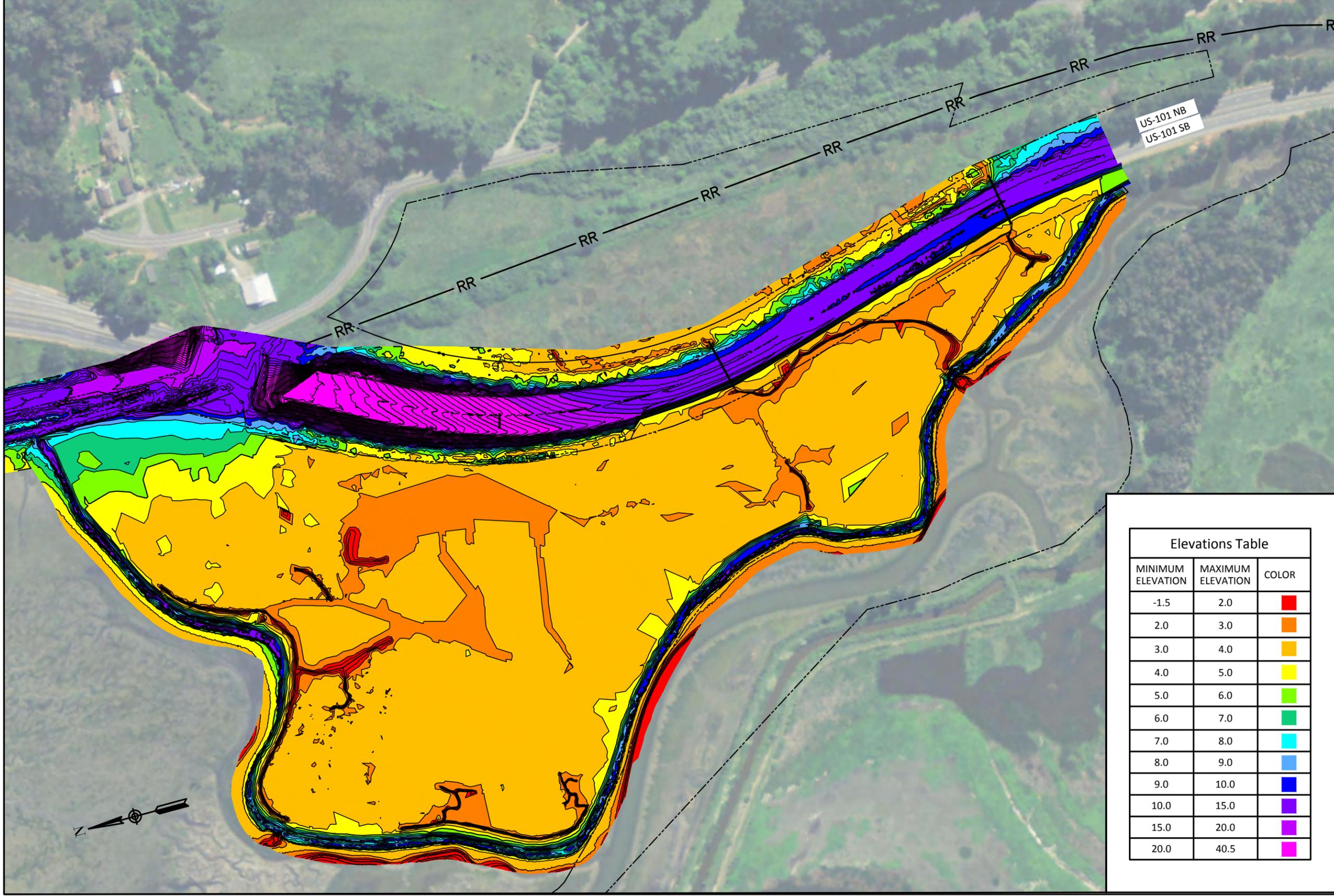


WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WEST WHITE SLOUGH PROJECT AREA
EXISTING FEATURES

NOTES:
(1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
(2) CULVERT CONDITIONS SURVEYED BY USFWS NOVEMBER 2014.

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SCALE: 0 250'				



MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
-1.5	2.0	Red
2.0	3.0	Orange
3.0	4.0	Yellow
4.0	5.0	Light Green
5.0	6.0	Green
6.0	7.0	Light Blue
7.0	8.0	Blue
8.0	9.0	Dark Blue
9.0	10.0	Dark Purple
10.0	15.0	Purple
15.0	20.0	Magenta
20.0	40.5	Bright Magenta

DESIGNED BY: DVD
 DRAWN BY: DVD/CCS
 APPROVED BY: CCS
 DATE: 1/22/2015
 SHEET NUMBER: 4

SCALE: 0 250'

WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WEST WHITE SLOUGH PROJECT AREA
 EXISTING TOPOGRAPHY

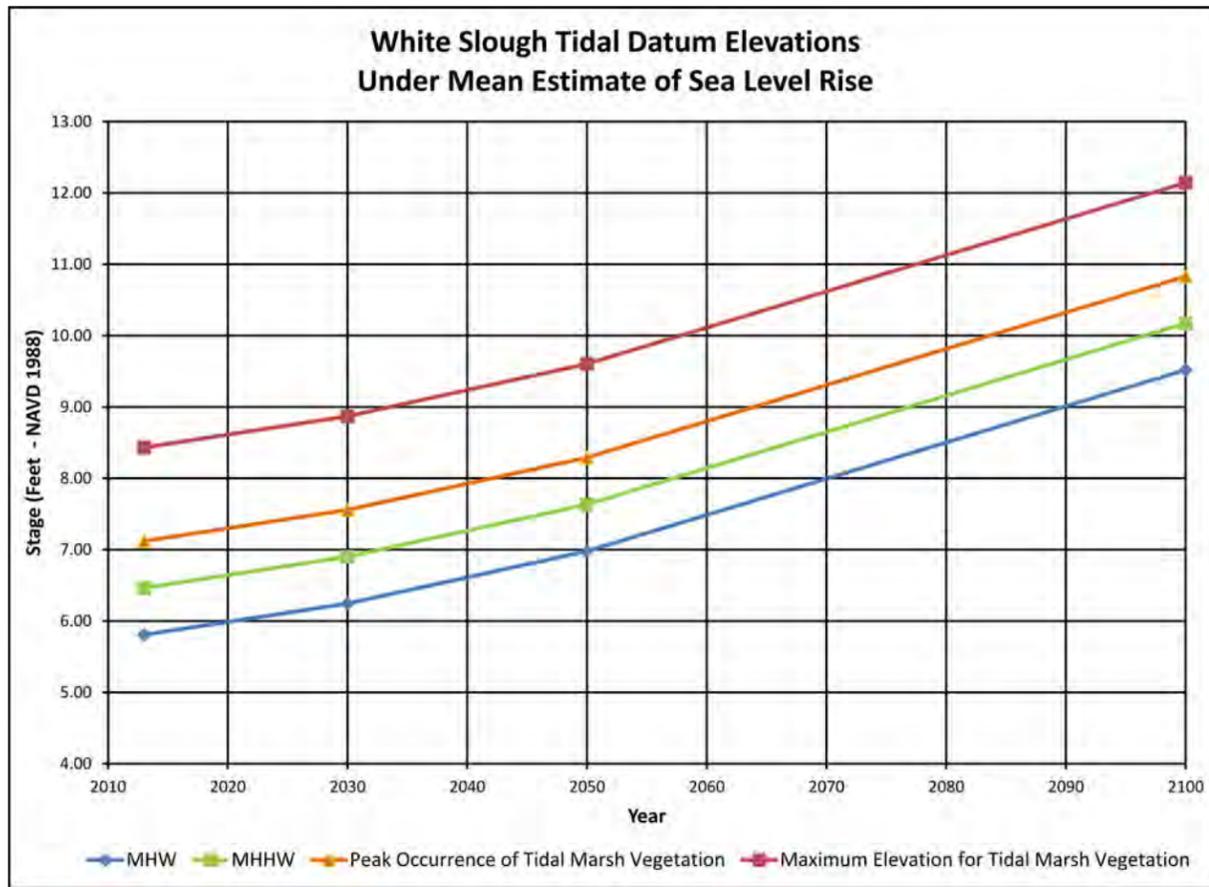
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 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) CONTOUR INTERVAL 1 FOOT - NAVD 1988 DATUM.
 (3) TOPOGRAPHY WITHIN WEST WHITE SLOUGH UNIT BASED ON USFWS SURVEYS.
 TOPOGRAPHY FOR OTHER AREAS BASED ON CALIFORNIA COASTAL CONSERVANCY LIDAR.



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US-101 NB
 US-101 SB

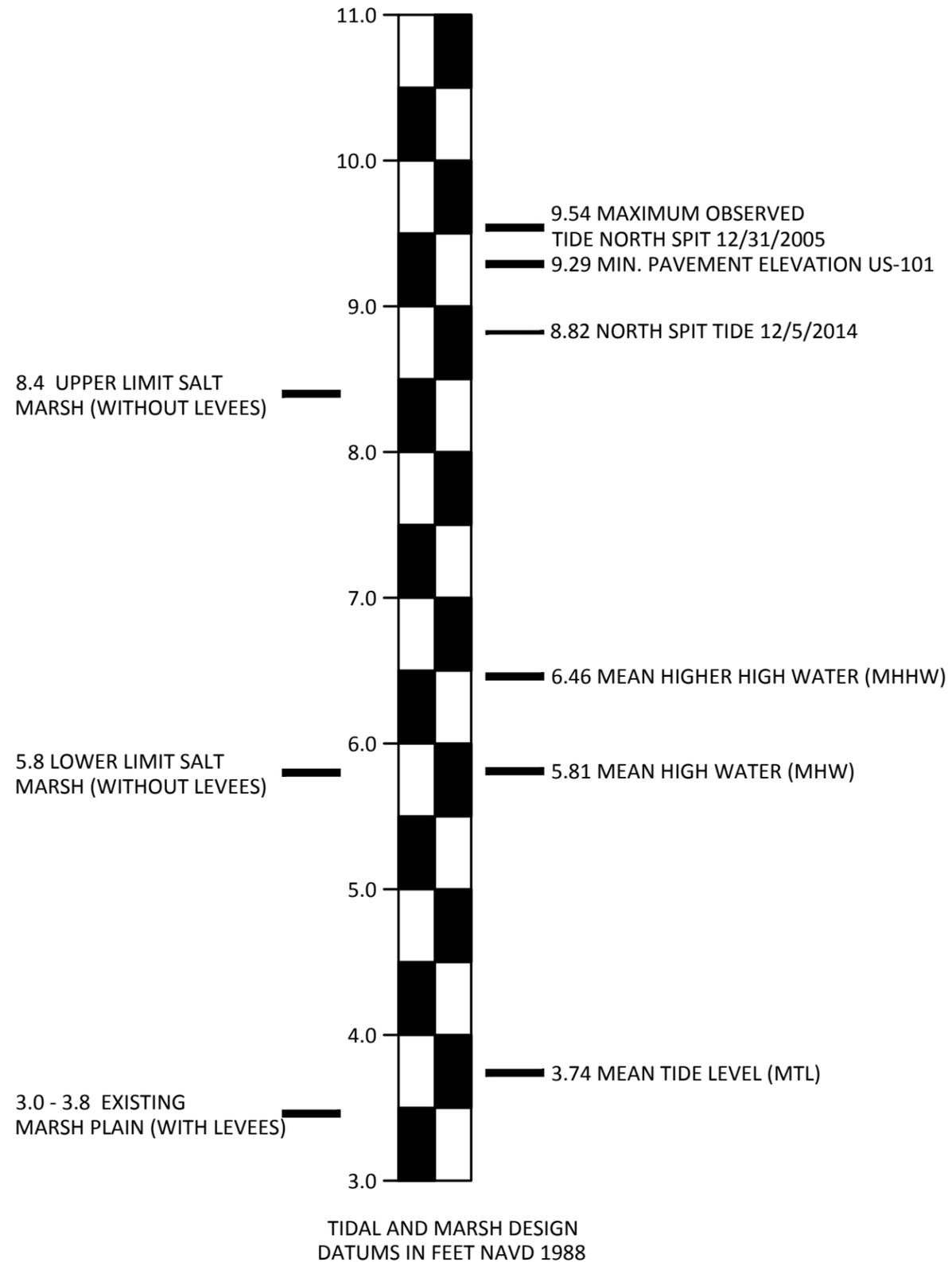


SEA LEVEL RISE ANALYSIS NOTES:

(1) SEA LEVEL RISE ESTIMATES BASED ON NATIONAL ACADEMIES OF SCIENCE (2012), SEA-LEVEL RISE FOR THE COASTS OF CALIFORNIA, OREGON, AND WASHINGTON: PAST, PRESENT, AND FUTURE, BRIEF REPORT 3.

(2) NAS REPORT ASSUMED VERTICAL LAND CHANGE OF +1.0 MM/YR UPLIFT RATE. ACTUAL LAND SURFACE VERTICAL CHANGE IN WHITE SLOUGH IS ESTIMATED TO BE A SUBSIDENCE OF -3.7 MM/YEAR (CASCADIA GEOSCIENCE (2013), HUMBOLDT BAY VERTICAL REFERENCE SYSTEM WORKING GROUP PRESENTATION TO HUMBOLDT BAY INITIATIVE MEETING: SEP-20-2013). NAS SEA-LEVEL RISE ESTIMATES ADJUSTED BY -4.7 MM/YEAR TO ACCOUNT FOR LOCAL CHANGE IN LAND ELEVATION.

(3) WHITE SLOUGH TIDAL DATUMS BASED ON 2013 FIELD MEASUREMENTS PRESENTED IN TAKEKAWA, J.Y., THORNE, K.M., BUFFINGTON, K.J., FREEMAN, C.M., POWELSON, K.W., AND BLOCK G. 2013. *DOWNSCALING CLIMATE CHANGE MODELS TO LOCAL SITE CONDITIONS: EFFECTS OF SEA-LEVEL RISE AND EXTREME EVENTS TO HUMBOLDT BAY NATIONAL WILDLIFE REFUGE*. UNPUBL. DATA SUMMARY REPORT. U.S. GEOLOGICAL SURVEY, WESTERN ECOLOGICAL RESEARCH CENTER, VALLEJO, CA. 126PP.



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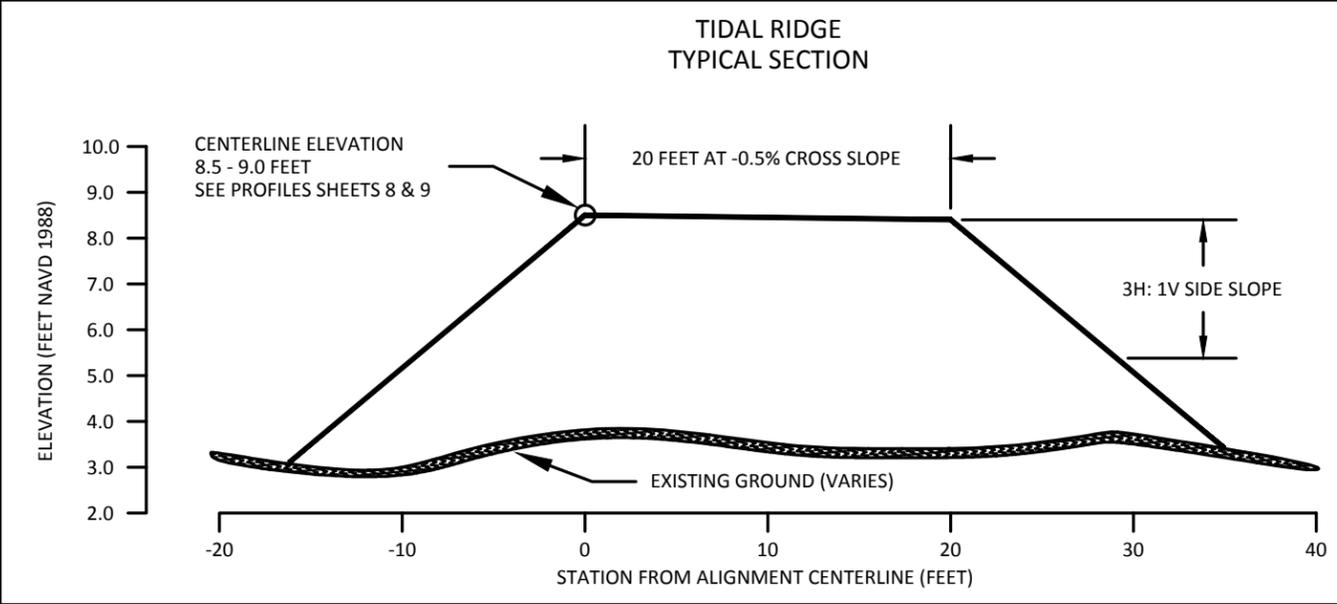
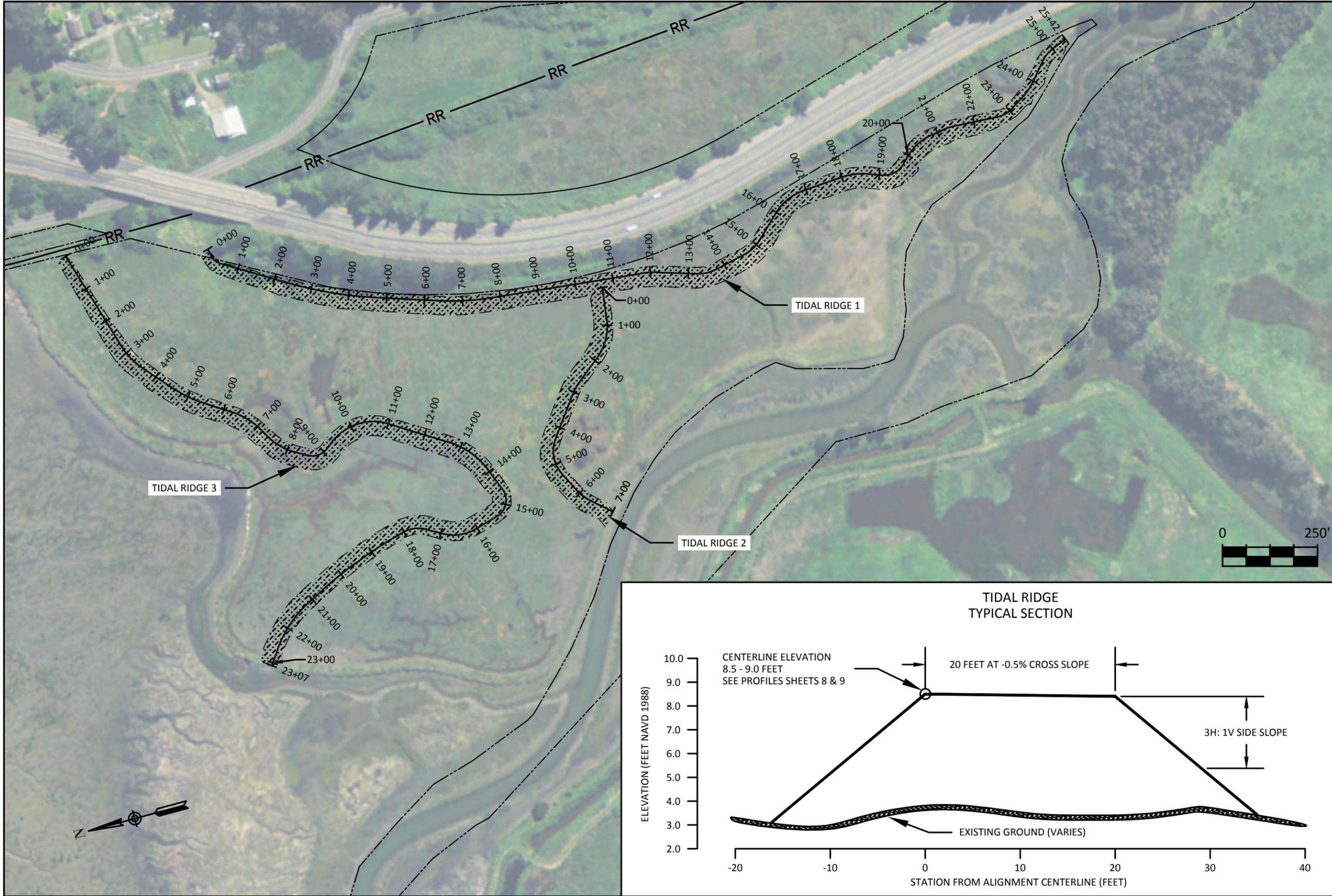


WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WHITE SLOUGH TIDAL DATUMS

DESIGNED BY: CCS	DRAWN BY: CCS/DVD	APPROVED BY: CCS	DATE: 1/22/2015	SHEET NUMBER: 5
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SCALE:
N/A



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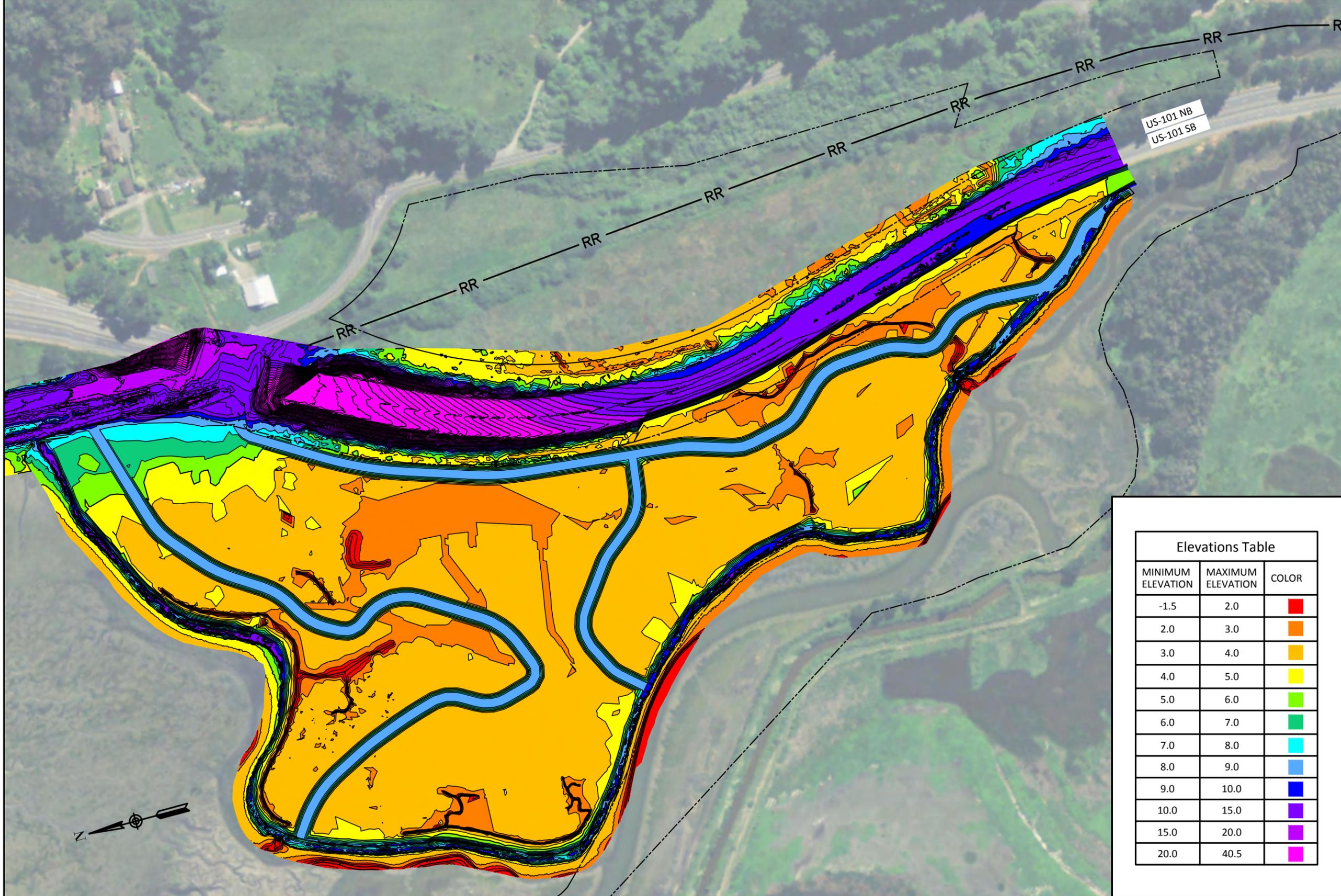


WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WEST WHITE SLOUGH PHASE 1:
 TIDAL RIDGE ALIGNMENTS AND TYPICAL SECTION

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).

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SCALE:				



MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
-1.5	2.0	Red
2.0	3.0	Orange
3.0	4.0	Yellow
4.0	5.0	Light Green
5.0	6.0	Green
6.0	7.0	Cyan
7.0	8.0	Blue
8.0	9.0	Dark Blue
9.0	10.0	Purple
10.0	15.0	Light Purple
15.0	20.0	Magenta
20.0	40.5	Dark Magenta

DESIGNED BY: CCS/DVD
 DRAWN BY: DVD/CCS
 APPROVED BY: CCS
 DATE: 1/22/2015
 SCALE: 0 250'

SHEET NUMBER: 7

WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WEST WHITE SLOUGH PHASE 1:
 PROPOSED TOPOGRAPHY WITH CONSTRUCTED TIDAL RIDGES

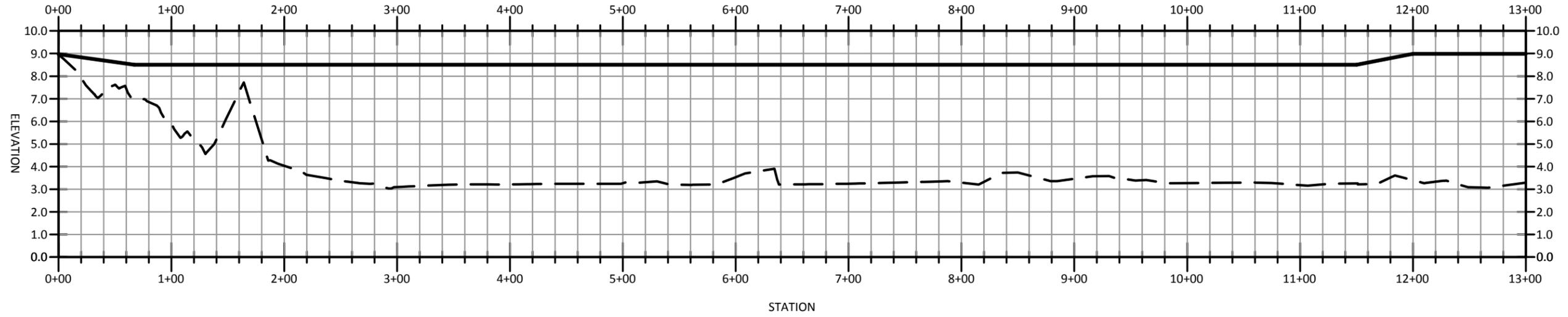
NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) CONTOUR INTERVAL 1 FOOT - NAVD 1988 DATUM.
 (3) TOPOGRAPHY WITHIN WEST WHITE SLOUGH UNIT BASED ON USFWS SURVEYS.
 TOPOGRAPHY FOR OTHER AREAS BASED ON CALIFORNIA COASTAL CONSERVANCY LIDAR.



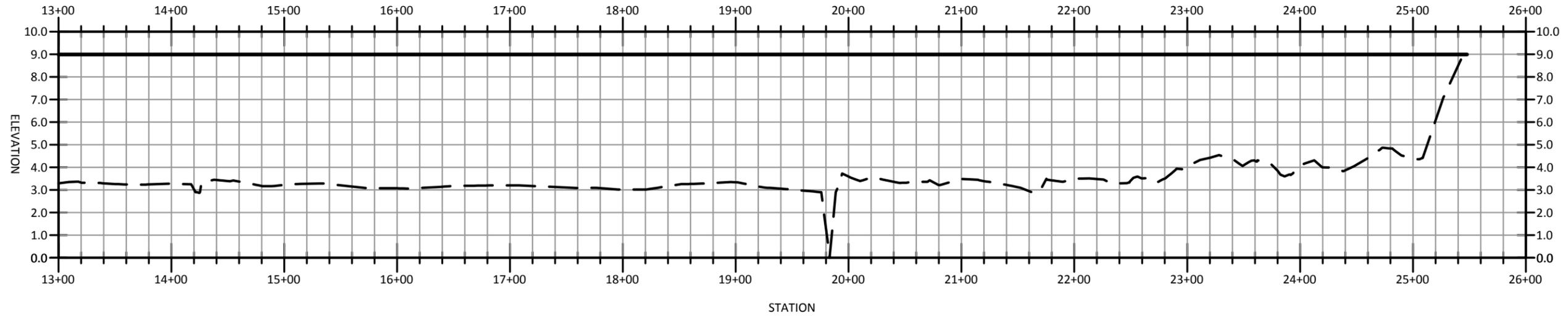
U.S. FISH AND WILDLIFE SERVICE
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TIDAL RIDGE 1 STATION 0+00 TO 13+00



TIDAL RIDGE 1 STATION 13+00 TO 26+00



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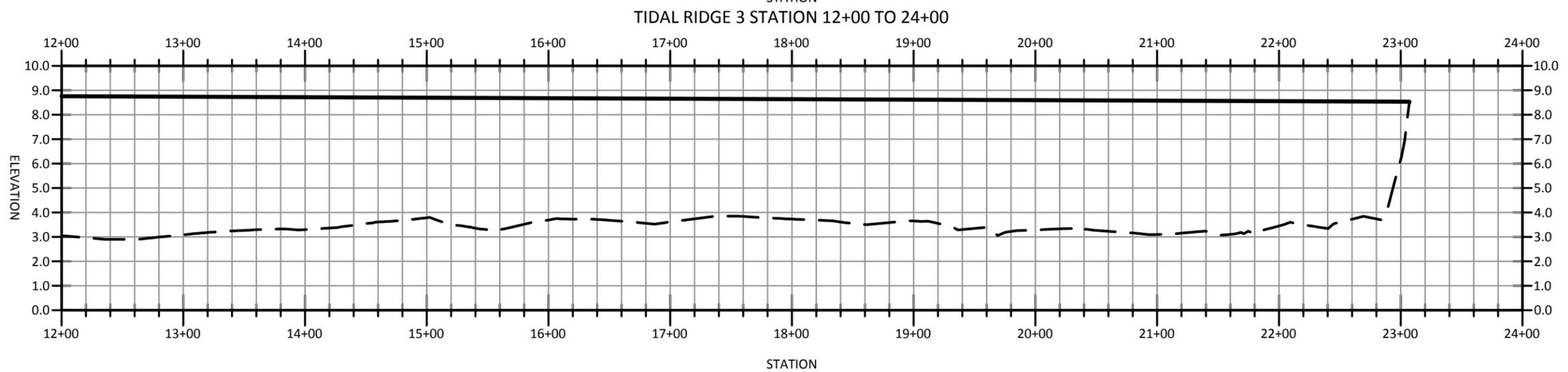
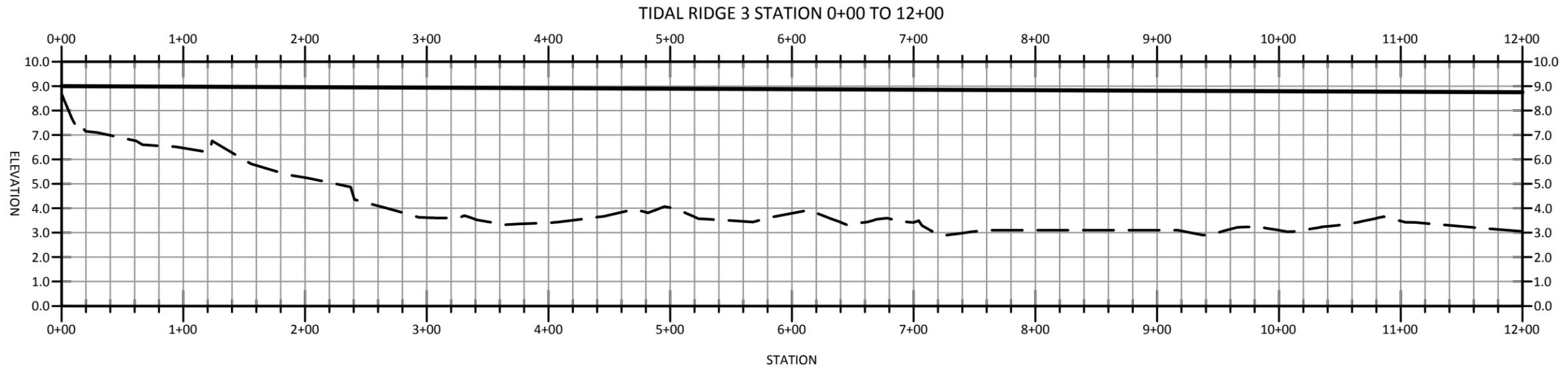
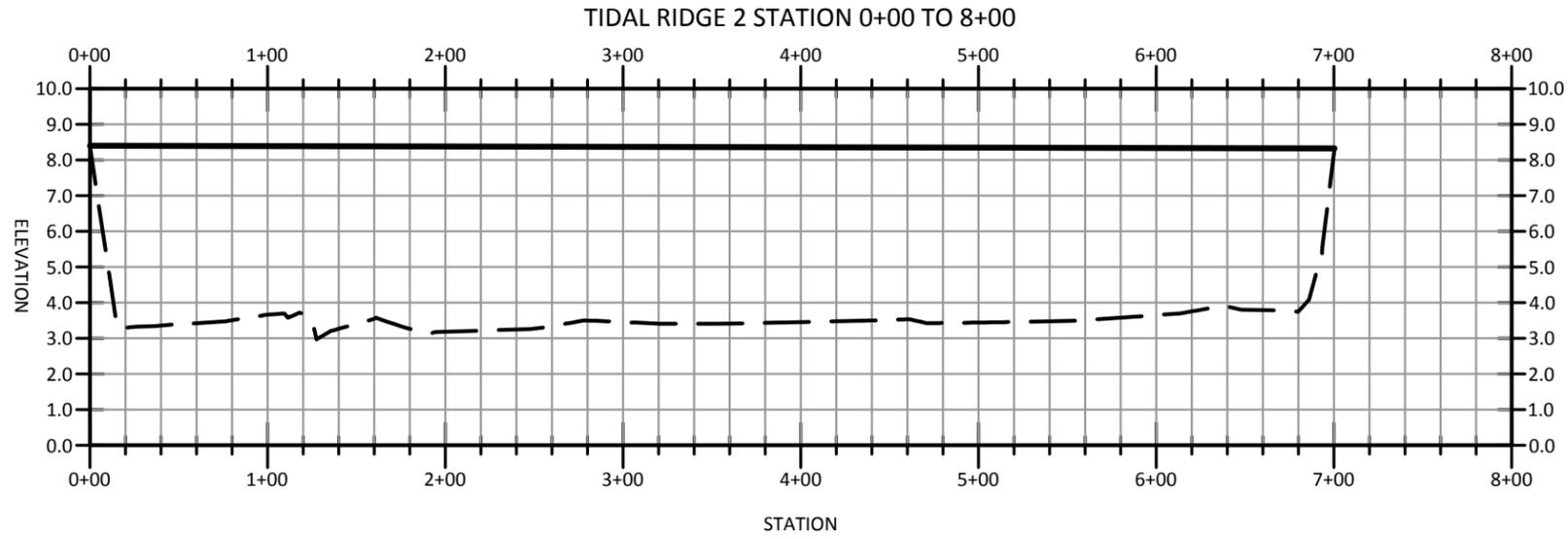
WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
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WEST WHITE SLOUGH PHASE 1:
 TIDAL RIDGE 1 PROFILE

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).

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SCALE:



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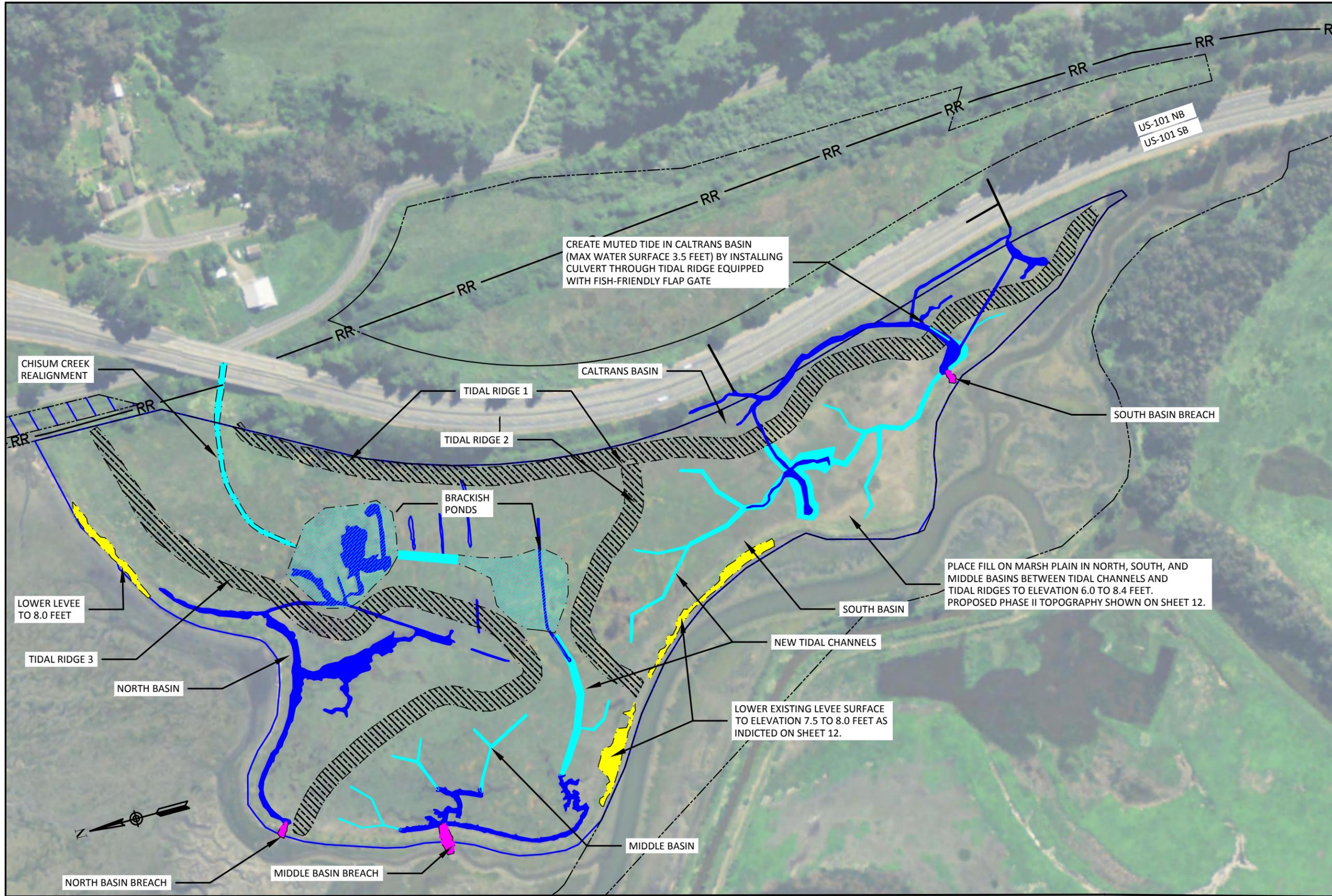
WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
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WEST WHITE SLOUGH PHASE 1:
 TIDAL RIDGES 2 AND 3 PROFILES

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).

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SCALE:



CREATE MUTED TIDE IN CALTRANS BASIN (MAX WATER SURFACE 3.5 FEET) BY INSTALLING CULVERT THROUGH TIDAL RIDGE EQUIPPED WITH FISH-FRIENDLY FLAP GATE

PLACE FILL ON MARSH PLAIN IN NORTH, SOUTH, AND MIDDLE BASINS BETWEEN TIDAL CHANNELS AND TIDAL RIDGES TO ELEVATION 6.0 TO 8.4 FEET. PROPOSED PHASE II TOPOGRAPHY SHOWN ON SHEET 12.

LOWER EXISTING LEVEE SURFACE TO ELEVATION 7.5 TO 8.0 FEET AS INDICATED ON SHEET 12.

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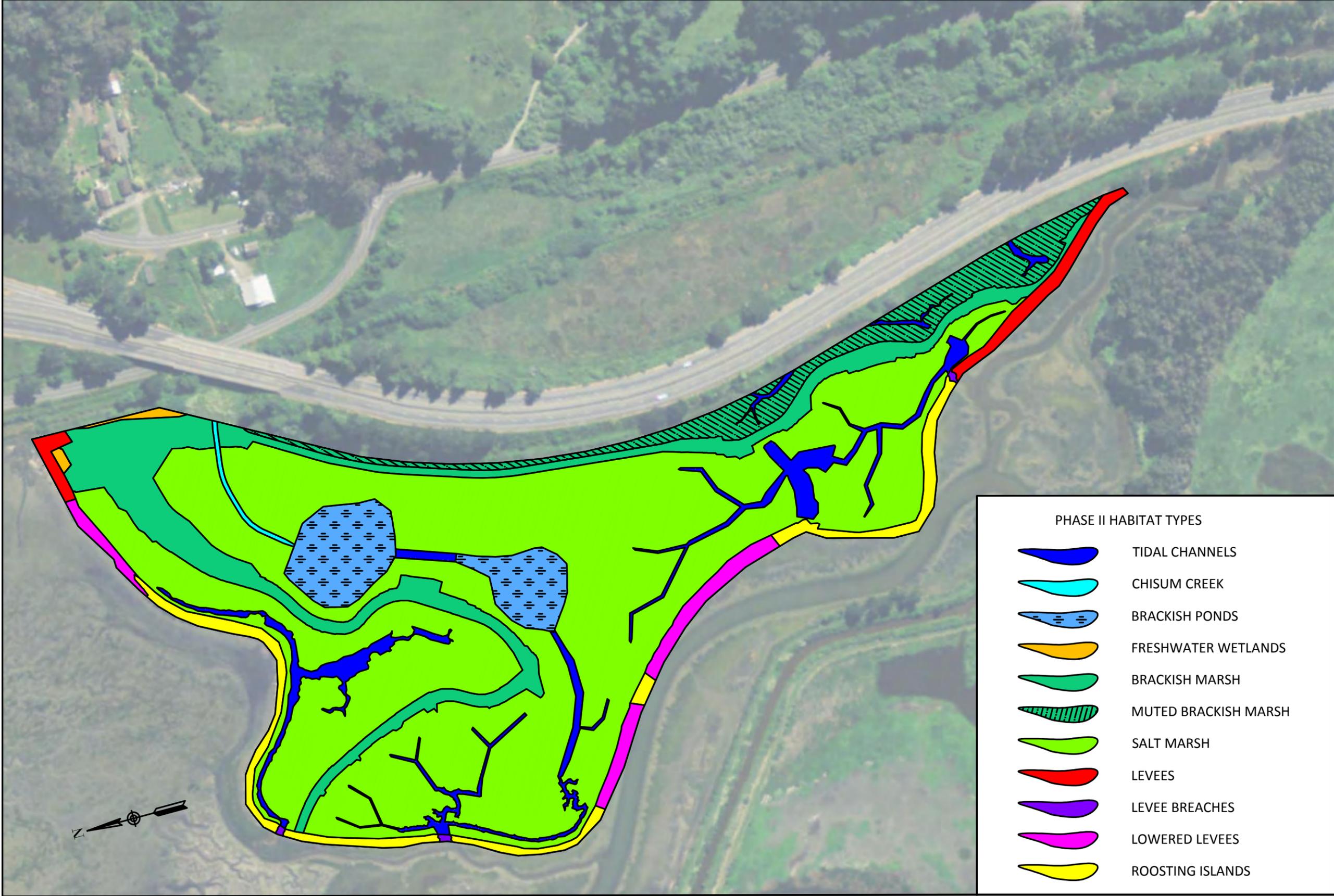


WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)

WEST WHITE SLOUGH PROJECT AREA PHASE II:
 PROJECT ELEMENTS

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) CONTOUR INTERVAL 1 FOOT - ALL ELEVATION REFERENCE TO NAVD 1988 DATUM.
 (3) TOPOGRAPHY WITHIN WEST WHITE SLOUGH UNIT BASED ON USFWS SURVEYS.
 TOPOGRAPHY FOR OTHER AREAS BASED ON CALIFORNIA COASTAL CONSERVANCY LIDAR.

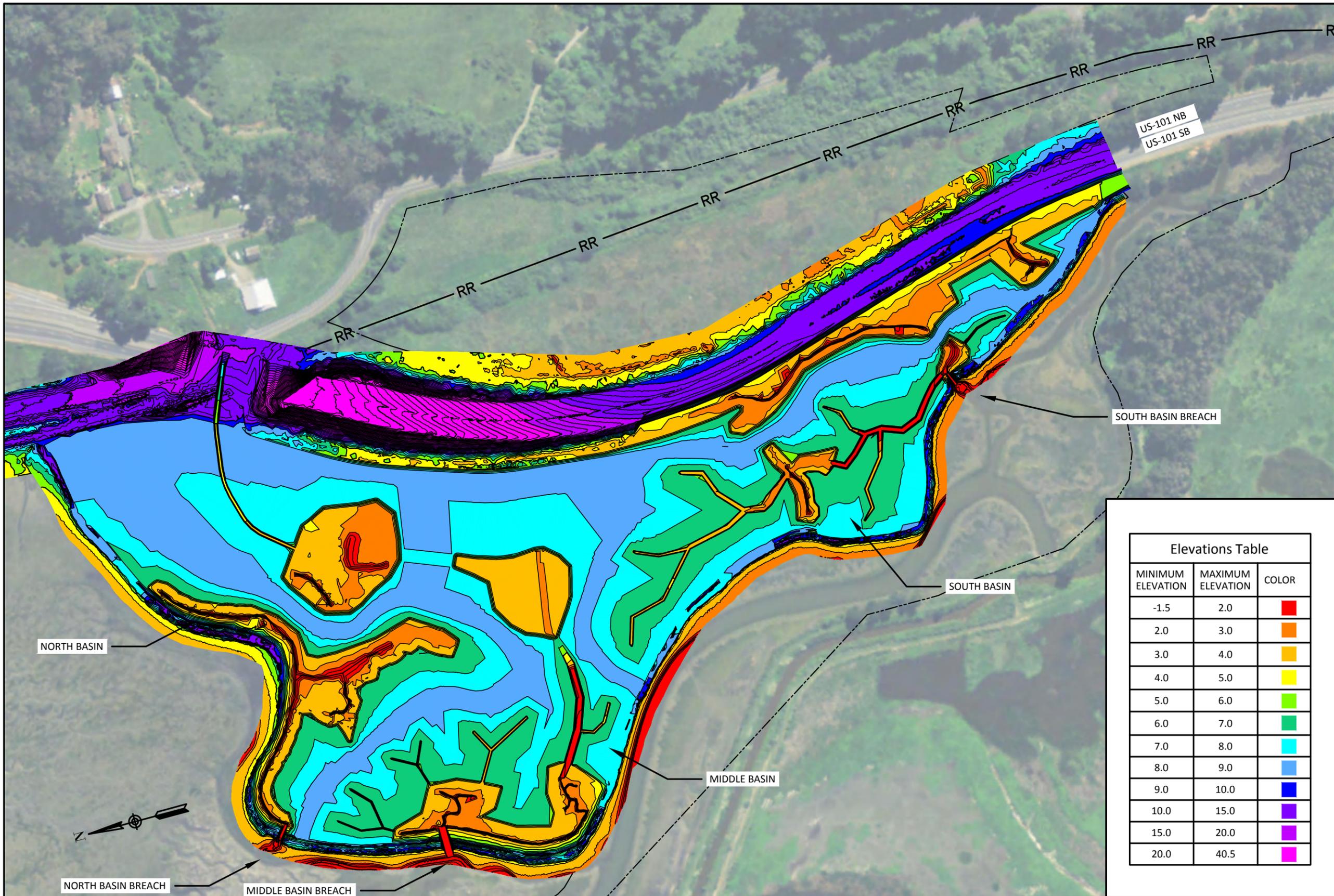
DESIGNED BY: DVD/CCS	DRAWN BY: DVD/CCS	APPROVED BY: CCS	DATE: 1/22/2015	SHEET NUMBER: 10
SCALE: 0 250'				



PHASE II HABITAT TYPES

	ROOSTING ISLANDS
	LOWERED LEVEES
	LEVEE BREACHES
	LEVEES
	SALT MARSH
	MUTED BRACKISH MARSH
	BRACKISH MARSH
	FRESHWATER WETLANDS
	BRACKISH PONDS
	CHISUM CREEK
	TIDAL CHANNELS

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WHITE SLOUGH WETLAND ENHANCEMENT PROJECT 50% CONCEPT PLANS (NOT FOR CONSTRUCTION)		
WEST WHITE SLOUGH PROJECT AREA PHASE II: PROPOSED HABITAT TYPES		
DESIGNED BY: DVD/CCS	DRAWN BY: DVD/CCS	APPROVED BY: CCS
SCALE: 0 250'	DATE: 1/22/2015	SHEET NUMBER: 12
NOTES:		



MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
-1.5	2.0	Red
2.0	3.0	Orange
3.0	4.0	Yellow
4.0	5.0	Light Green
5.0	6.0	Green
6.0	7.0	Cyan
7.0	8.0	Blue
8.0	9.0	Dark Blue
9.0	10.0	Purple
10.0	15.0	Dark Purple
15.0	20.0	Magenta
20.0	40.5	Bright Magenta

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WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
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WEST WHITE SLOUGH PROJECT AREA
 PHASE II: PROPOSED TOPOGRAPHY

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) CONTOUR INTERVAL 1 FOOT - NAVD 1988 DATUM.
 (3) TOPOGRAPHY WITHIN WEST WHITE SLOUGH UNIT BASED ON USFWS SURVEYS.
 TOPOGRAPHY FOR OTHER AREAS BASED ON CALIFORNIA COASTAL CONSERVANCY LIDAR.

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 DRAWN BY: DVD/CCS
 APPROVED BY: CCS
 DATE: 1/22/2015
 SHEET NUMBER: 11

SCALE: 0 250'

PHASE III: CALTRANS BASIN FILL
 - FILL AREA BETWEEN TIDAL RIDGE 1 AND 9.0 FOOT CONTOUR LINE AS INDICATED.

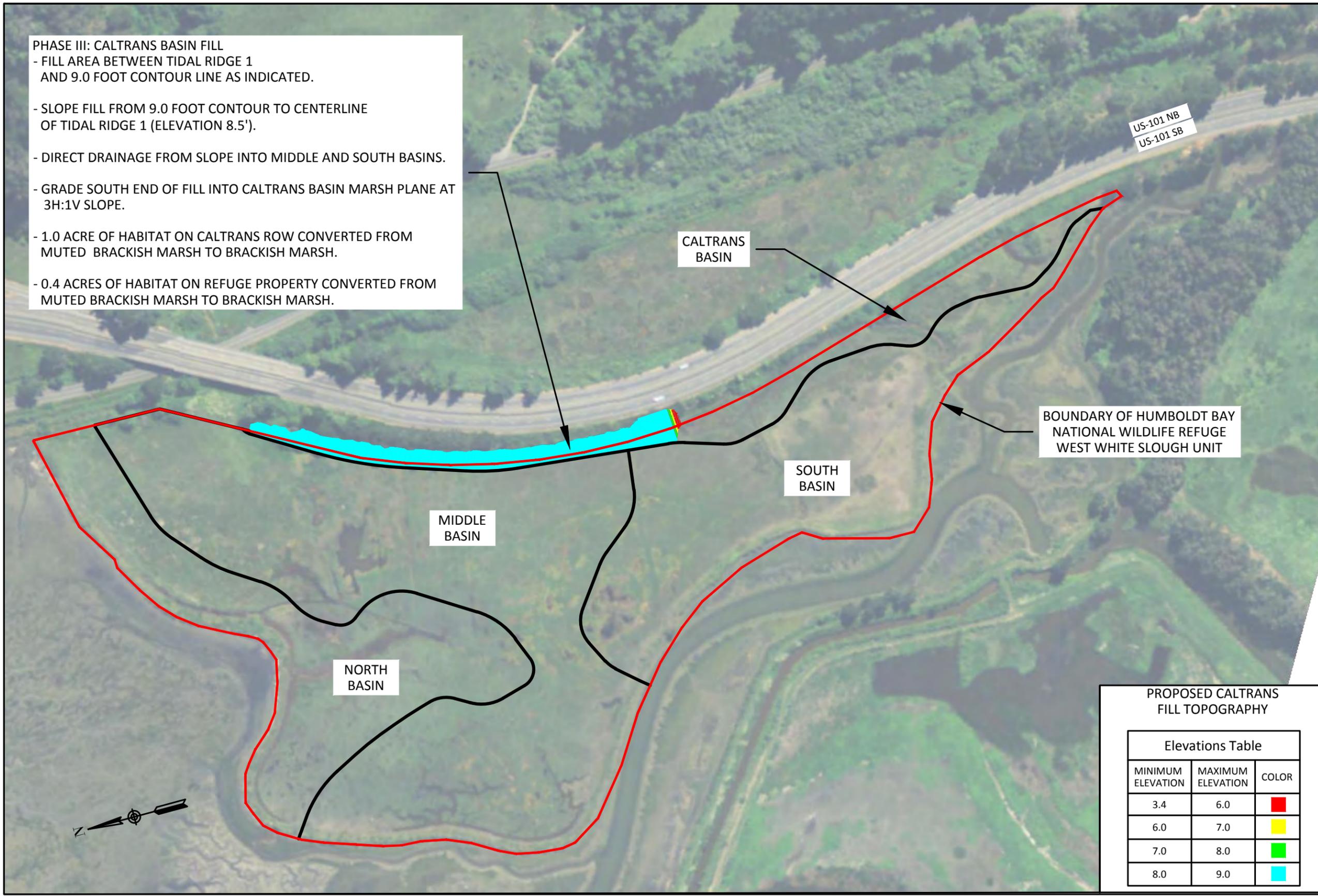
- SLOPE FILL FROM 9.0 FOOT CONTOUR TO CENTERLINE OF TIDAL RIDGE 1 (ELEVATION 8.5').

- DIRECT DRAINAGE FROM SLOPE INTO MIDDLE AND SOUTH BASINS.

- GRADE SOUTH END OF FILL INTO CALTRANS BASIN MARSH PLANE AT 3H:1V SLOPE.

- 1.0 ACRE OF HABITAT ON CALTRANS ROW CONVERTED FROM MUTED BRACKISH MARSH TO BRACKISH MARSH.

- 0.4 ACRES OF HABITAT ON REFUGE PROPERTY CONVERTED FROM MUTED BRACKISH MARSH TO BRACKISH MARSH.



US-101 NB
US-101 SB

CALTRANS BASIN

SOUTH BASIN

MIDDLE BASIN

NORTH BASIN

BOUNDARY OF HUMBOLDT BAY NATIONAL WILDLIFE REFUGE WEST WHITE SLOUGH UNIT

PROPOSED CALTRANS FILL TOPOGRAPHY

Elevations Table		
MINIMUM ELEVATION	MAXIMUM ELEVATION	COLOR
3.4	6.0	Red
6.0	7.0	Yellow
7.0	8.0	Green
8.0	9.0	Cyan

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WHITE SLOUGH WETLAND ENHANCEMENT PROJECT
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WEST WHITE SLOUGH PROJECT AREA PHASE III:
 CALTRANS BASIN FILL PROJECT ELEMENTS

NOTES:
 (1) IMAGE SOURCE: 2012 NRCS NATIONAL AERIAL IMAGERY PROGRAM (NAIP).
 (2) CONTOUR INTERVAL 1 FOOT - NAVD 1988 DATUM.
 (3) TOPOGRAPHY WITHIN WEST WHITE SLOUGH UNIT BASED ON USFWS SURVEYS. TOPOGRAPHY FOR OTHER AREAS BASED ON CALIFORNIA COASTAL CONSERVANCY LIDAR.

DESIGNED BY: DVD/CCS
 DRAWN BY: DVD/CCS
 APPROVED BY: CCS
 DATE: 1/22/2015
 SHEET NUMBER: 13

SCALE: 0 250'

Appendix 2. Special Status Species Lists

USFWS's Official Species List of Threatened and Endangered Species, for the Fields Landing quadrangle

California Natural Diversity Database, for the Fields Landing quadrangle

List of Species with Potential to Occur in the Project Area

USFWS Listed Species Database

Fields Landing, Arcata South, Eureka, McWhinney Creek, Cannibal Island, Fortuna, Ferndale,
and Hydesville Quadrangles

Database last updated: September 18, 2011, Report Date: April 3, 2014

Listed Species

Fish

Eucyclogobius newberryi, tidewater goby (E), and its critical habitat (X)

Oncorhynchus kisutch, coho salmon, So OR/No CA (T) (NMFS)

Oncorhynchus mykiss, Northern California steelhead (T) (NMFS), and its critical habitat (X) (NMFS)

Oncorhynchus tshawytscha, California coastal chinook salmon (T) (NMFS) and its critical habitat (X) (NMFS)

Birds

Brachyramphus marmoratus, marbled murrelet (T)

Charadrius alexandrinus nivosus, western snowy plover (T)

Pelecanus occidentalis californicus, California brown pelican (E)

Strix occidentalis caurina, northern spotted owl (T)

Plants

Erysimum menziesii (includes ssp. *yadonii*), Menzies's wallflower (E)

Layia carnosa, beach layia (E)

Key: (E) Endangered - Listed as being in danger of extinction; (T) Threatened - Listed as likely to become endangered within the foreseeable future; (NMFS) Species under the Jurisdiction of the [National Oceanic & Atmospheric Administration Fisheries Service](#). Consult with them directly about these species; Critical Habitat - Area essential to the conservation of a species; (X) Critical Habitat designated for this species

California Natural Diversity Database Special Status Wildlife Species Potentially Occurring in the Project Vicinity. CNDDDB Search on 7/16/2014. Quads Searched: Fields Landing, Arcata South, Eureka, McWhinney Creek, Cannibal Island, Fortuna, Ferndale, and Hydesville. Abbreviations: -=None; T: Threatened; E=Endangered; C=Candidate; SSC=Species of Special Concern; WL=Watchlist; FP=Fully Protected; DL=Delisted

<u>Scientific Name</u>	<u>Common Name</u>	<u>Fed/State/DFW Status</u>	Habitat	Probability of occurrence in Project Area
Bird Species				
<i>Accipiter cooperii</i>	Cooper's hawk	-/-/WL	(Nesting) Nests primarily in deciduous riparian forests; forages in open woodlands and marsh.	Moderate. Riparian habitat present along railroad tracks.
<i>Accipiter striatus</i>	sharp-shinned hawk	-/-/WL	(Nesting) Breeds in ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats. Prefers, but not restricted to, riparian habitats. North-facing slopes, with plucking perches are critical requirements. All habitats except alpine, open prairie, and bare desert used in winter.	Moderate. Riparian habitat present along railroad tracks. Foraging habitat over marsh.
<i>Agelaius tricolor</i>	tricolored blackbird	-/-/SSC	Colonial nester near fresh water, in emergent wetland plants but also thickets of willow, blackberry, and wild rose. Feeds in grassland and cropland habitats.	Low. Some riparian and freshwater marsh habitat is present. Small colony (up to 70 birds) documented near Alton, about 10 miles to the south.
<i>Ardea alba</i>	great egret	-/-/-	(Rookery) Colonial nester in large trees. Rookery sites located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	Low. No large trees suitable for roosting present in project area.
<i>Ardea herodias</i>	great blue heron	-/-/-	(Rookery) Colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, wet meadows.	Low. No large trees suitable for roosting present in project area.
<i>Brachyrampus marmoratus</i>	Marbled murrelet	T/E/-	Nests in old growth forest. Non-nesting time and hunting at sea and resting on shore.	None. Habitat absent from project area.
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	T/-/SSC	Breed and winter along ocean beaches and the gravel bars of the Eel River. Nesting occurs above the high tide line in sandy substrate, and occasionally on driftwood. May nest in salt pans. May winter in estuarine sand and mudflats and forage on edges of salt marsh and in salt pans.	Low. Present on Humboldt Bay spits, and could potentially forage in marsh in project area. May forage on edges of salt marsh and winter in estuarine sand and mud flats in project area.

Charadrius montanus	mountain plover	-/-/SSC	Native to short-grass prairie and shrub-steppe landscapes. Not found near water. Breeds in western Great Plains and Rocky Mountain States from Canada to northern Mexico. Winters mostly in California, southern Arizona, Texas and Mexico. Occasional vagrants on northern CA coast.	None. Habitat absent from project area.
Circus cyaneus	Northern harrier	C/-/SSC	(Nesting) Coastal salt marsh and freshwater marsh; nests and forages in grasslands; nests on ground in shrubby vegetation, usually at marsh edge.	Moderate. Habitat present in project area.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	-/E/-	Willow-cottonwood riparian forest, but other species such as alder and box elder may be important in some areas. Nests are primarily in willow trees; however, other species are occasionally used, including cottonwood and alder. Along the Sacramento River, English walnut trees and more rarely prune, plum, and almond trees in adjacent orchards have also been reportedly used for nesting.	Low. Riparian scrub present in project area, but nesting is unlikely because riparian is not large or dense.
Dendroica petechia	Yellow warbler	-/-/SSC	Riparian habitat often dominated by willows, near water in streams and wet meadows	High. Common in riparian habitat in Humboldt County.
Egretta thula	snowy egret	-/-/-	(Rookery) Colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	None. Rookery habitat not found in project area.
Empidonax traillii	Willow flycatcher	-/E/-	Riparian habitat often dominated by willows and/or alder, and permanent water, often in the form of low gradient watercourses, ponds, lakes, wet meadows, marshes, and seeps within and adjacent to forested landscapes.	Moderate. Riparian scrub and marsh present in project area.
Falco columbarius	Merlin	DL/-/SSC	(Wintering) Breeds in Canada, winters in a variety of California habitats, including grasslands, savannahs, wetlands, etc.	Low. Wintering habitat is present. Uncommon winter resident in region.
Falco peregrinus	Peregrine falcon	DL/DL/FP	Nests in woodland, forest and coastal habitats, on cliffs or banks, and usually near wetlands, lakes, rivers, sometimes on human-made structure. In non-breeding seasons found in riparian areas and coastal and inland wetlands.	Low. Infrequent visitor to project vicinity.

Haliaeetus leucocephalus	bald eagle	-E/FP	(Nesting and Wintering) Ocean shore, lake margins, and rivers for both nesting and wintering. Most nests within 1 mile of water. Nests in large, old growth, or dominant live tree with open branches, especially ponderosa pine. Roosts communally in winter.	No breeding habitat. May occur rarely as transient.
Numenius americanus	long-billed curlew	-/-/WL	Breeds on plains, grasslands and prairies from southern Canada to northern California, Utah, northern New Mexico and Texas. Winters on lake and river shores, marshes, mudflats and sandy beaches in Mexico and Central America. Occasionally winters in the United States in California, Texas, Louisiana and from South Carolina to Florida.	Moderate. Forages on mudflats in project vicinity. May utilize project area for roosting/high tide refuge habitat.
Nycticorax nycticorax	black-crowned night heron	-/-	(Rookery) Colonial nester, usually in trees, occasionally in tule patches. Rookery sites located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	Moderate. Suitable habitat present in project area.
Pandion haliaetus	osprey	-/-/WL	(Nesting) Ocean shore, bays, freshwater lakes, and larger streams. Large nests built in treetops, primarily in Ponderosa pine through mixed conifer habitats, within 15 miles of good fish-producing body of water. Associated strictly with large, fish-bearing waters.	Low. No trees suitable for roosting present in project area. May forage in project area.
Pelecanus occidentalis californicus	California brown pelican	DL/DL/FP	Rest and roost on offshore rocks and islands, in bays and river mouths with sand bars, on jetties, pilings, and even boats along the Pacific coast. Feed within 8 km of land. Winters Gulf of California, Mexico, north to Washington and southern British Columbia, Canada. Breeds on islands in the Gulf of California, outer coast of Baja California, and north on California's Anacapa and Santa Barbara Islands.	Low. Present in Hookton Slough but not Salmon Creek or White Slough. Could rest and roost in project area.
Phalacrocorax auritus	double-crested cormorant	-/-/WL	(Rookery) Colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the state. Nests along coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	Moderate. No known nesting colonies in project vicinity.
Poecile atricapillus	Black-capped chickadee	T/-/SSC	Occurs locally in montane riparian habitat from coast into mountainous areas inland.	Moderate. Riparian scrub present in project area.

Rallus longirostris obsoletus	California clapper rail	E/E/FP	Tidal marsh and mudflats. Historically known from Humboldt Bay, currently known only from SF Estuary.	None. Not extant in project vicinity.
Riparia riparia	Bank swallow	-/T/-	Breeds in nesting colonies in alluvial soils along rivers, streams, lakes, and ocean coasts, mostly in riparian habitat and especially in large lowland river valleys in Northern CA.	Low. Small amount of habitat present in project area but not detected in previous surveys.
Strix nebulosa	great gray owl	-/E/-	Occur in a wide range of habitats and elevations but prefer forest and meadow associations . Mature and old-growth coniferous and deciduous forests with a high density of snags are preferred for breeding.	Low. Preferred habitat not present in project area. Rare in coastal CA.
Strix occidentalis caurina	Northern spotted owl	T-/SSC	Northcoast coniferous forest generally found in older stands.	None. No habitat in project area.
Amphibians				
Ascaphus truei	Pacific tailed frog	-/-/SSC	Occurs in montane hardwood-conifer, redwood, Douglas fir and Ponderosa pine habitats. Restricted to perennial montane streams. Tadpoles require water below 15° C.	None. Habitat absent from project area.
Rana aurora	northern red-legged frog	-/-/SSC	Humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover. Generally near permanent water, but can be found far from water, in damp woods and meadows, during nonbreeding season.	Moderate. May be found in freshwater marsh and riparian habitat.
Rana boylei	foothill yellow-legged frog	-/-/SSC	Shallow, shaded perennial streams and ponds with rocky substrate.	None. Habitat absent from project area.
Rhyacotriton variegatus	southern torrent salamander	-/-/SSC	Coastal redwood, Douglas fir, mixed conifer, montane riparian, montane hardwood-conifer habitats, old growth forest. Cold, well-shaped, permanent streams and seepages, or within splash zone or on moss-covered rock within trickling water.	None. Habitat absent from project area.
Mammals				
Antrozous pallidus	pallid bat	-/-/SSC	Most common in open, dry habitats with rocky areas for roosting. Roost in rock crevices, trees, buildings, and bridges in arid regions.	Moderate. May forage in project area.

Arborimus pomo	Sonoma tree vole	-/-/SSC	North Coast fog belt from Oregon border to Sonoma County in Douglas fir, redwood, and montane hardwood-conifer forests. Feeds almost exclusively on Douglas fir needles. Will occasionally take needles of grand fir, hemlock or spruce.	None. Habitat absent from project area.
Corynorhinus townsendii	Townsend's big-eared bat	-/-/SSC	Most abundant in moist habitats. Roosts primarily in mines and caves, but also in buildings and other human structures.	Moderate. May forage in area.
Lasiurus cinereus	hoary bat	-/-/-	May be found in any location in CA. Roosts in trees	Moderate. Potential habitat in project area.
Martes americana humboldtensis	Humboldt marten	-/-/SSC	Occurs only in the coastal redwood zone from the Oregon border south to Sonoma County. Associated with late-successional coniferous forests, prefers forests with low, overhead cover.	None. Habitat absent from project area.
Myotis evotis	long-eared myotis	-/-/-	Found in a wide variety of habitats across most of Western North America, from grasslands and conifer forests, to humid coastal and montane forests. Most common in wooded riparian and montane coniferous forests.	Low. Little riparian habitat present in project area.
Pekania pennanti	fisher - West Coast DPS	C/C/SSC	Upland and lowland forests, including coniferous, mixed, and deciduous forests. Occurs primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover	None, no suitable habitat in project area.
Fish				
Acipenser medirostris	green sturgeon	E/-/SSC	Spawn in freshwater between February and July during periods of high flow and cold water. Confined to large, fast flowing channels and deep pools.	None. Habitat absent from project area.
Entosphenus tridentatus	Pacific lamprey	-/-/-	Spawn in gravel bottomed streams at the upstream end of riffle habitat. Rearing in backwater areas with fine sediments. Migrate to ocean as adults. Range from Baja California, to the Bering Sea in Alaska and Asia.	Low. Fish passage from Humboldt Bay and White Slough is obstructed.
Eucyclogobius newberryi	tidewater goby	E/-/SSC	Brackish water habitats along the Calif. Coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels.	High. Suitable habitat in project area. Known from project vicinity.

Lampetra richardsonii	western brook lamprey	-/-/	Coastal streams from southeastern Alaska south to California and inland in the Columbia and Sacramento-San Joaquin River drainages. Found in clear, cold water in little disturbed watersheds. Utilize clean gravel near cover for spawning. Rear in slow moving water with fine sediment.	Low. Fish passage from Humboldt Bay and White Slough is obstructed.
Oncorhynchus clarkii clarkii	coast cutthroat trout	-/-/SSC	Small coastal streams from the Eel River to the Oregon border. Small, low gradient coastal streams and estuaries Well-oxygenated streams with riffles; loose, silt-free gravel substrate.	Low. Present in Humboldt Bay and Salmon Creek near the project area, but barriers prevent this species from reaching the project area.
Oncorhynchus kisutch	Coho Salmon – Southern Oregon/Northern California ESU	T/T/-	Well-oxygenated streams with riffles; loose, siltfree gravel substrate. Federal listing refers to populations between Cape Blanco, Oregon, and Punta Gorda, Humboldt County, CA. State listing refers to populations between the Oregon border and Punta Gorda, CA.	Low. Present in Humboldt Bay and Salmon Creek near the project area, but barriers prevent this species from reaching the project area.
Oncorhynchus mykiss	Northern Steelhead	T/-/	Well-oxygenated streams with riffles; loose, siltfree gravel substrate.	Low. Present in Humboldt Bay and Salmon Creek near the project area, but barriers prevent this species from reaching the project area.
Oncorhynchus tshawytscha	Chinook Salmon – California Coast ESU	T/-/SSC	Well-oxygenated streams with riffles; loose, siltfree gravel substrate. Federal listing refers to populations from Redwood Creek in Humboldt County to the Russian River in Sonoma County.	Low. Present in Humboldt Bay and Salmon Creek near the project area, but barriers prevent this species from reaching the project area.
Spirinchus thaleichthys	Longfin smelt	-T/SSC	Primary habitat is open estuary waters, typically in the middle or deeper areas of the water column. Spawn in estuaries in fresh or slightly brackish water over sandy or gravel substrates.	Low. Documented in Humboldt Bay adjacent to project area, but fish passage to project area is obstructed so unlikely to occur within project area.
Thaleichthys pacificus	Eulachon (Southern DPS)	T/-/	Spawn in rivers that are glacier-fed and/or have peak spring freshets	Low. Occur rarely in Humboldt Bay.
Insects				
Cicindela hirticollis gravida	sandy beach tiger beetle	-/-/	Inhabits areas adjacent to water such as sandy beaches of oceans, lakes, rivers and streams along the coast of CA from Humboldt Bay to Northern Mexico.	Low. Sandy substrate absent from project area.
Reptiles				

Actinemys marmorata	western pond turtle	-/-/SSC	Associated with permanent or nearly permanent water in a wide variety of habitats. Requires basking sites. Nest sites may be found up to 0.5 km from water.	Low. Sparsely distributed in North Coast, mainly in ponds in the interior. Possible near channels throughout project area.
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Special Status Plant Species Potentially Occurring in the Project Vicinity.

List produced by searching the California Native Plant Society's Inventory of Rare and Endangered Plants on 7/16/14. Quads Searched: Fields Landing, Arcata South, Eureka, McWhinney Creek, Cannibal Island, Fortuna, Ferndale, and Hydesville. Abbreviations: - =None; T: Threatened; E=Endangered; List 1B: Rare, Threatened, or Endangered in CA and Elsewhere, List 2B: Plants Rare, Threatened, or Endangered in CA, But More Common Elsewhere, List 3: More Information Needed, List 4: Plants of Limited Distribution (Watch List). List Modifiers/Threat Rankings: 0.1-Seriously threatened in CA (>80% of occurrences threatened / high degree and immediacy of threat); 0.2-Moderately threatened in CA (20-80% occurrences threatened / moderate degree and immediacy of threat); 0.3-Not very threatened in CA (<20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
Species with habitat in project area				
<i>Angelica lucida</i> Sea-watch	-/-/List 4.2	Coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps (coastal salt)	May-Sept	Low. Not documented in previous surveys but could occur in brackish marsh.
<i>Astragalus pycnostachyus</i> var. <i>Pycnostachyus</i> coastal marsh milk-vetch	-/-/List 1B.2	Coastal dunes(mesic), Coastal scrub, Marshes and swamps(coastal salt, streamsidess)	Apr-Oct	Low. Not documented in previous surveys but could occur in brackish marsh.
<i>Carex leptalea</i> bristle-stalked sedge	-/-/List 2B.2	Bogs and fens, Meadows and seeps(mesic), Marshes and swamps	Mar-Jul	Low. Not documented in previous surveys but could occur in freshwater wetlands and along creek or ditch.
<i>Carex lyngbyei</i> Lyngbye's sedge	-/-/List 2B.2	Marshes and swamps(brackish or freshwater)	May-Aug	Moderate. Brackish marsh present but species was not documented in prior surveys.
<i>Eleocharis parvula</i> small spikerush	-/-/List 4.3	Marshes and swamps	(Apr)Jun-Aug(Sep)	Moderate. Brackish marsh present but

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
				not documented in prior surveys.
<i>Lathyrus palustris</i> marsh pea	-/-/List 2B.2	Bogs and fens, Coastal prairie, Coastal scrub, Lower montane coniferous forest, Freshwater marshes and swamps, North Coast coniferous forest/mesic	Mar-Aug	Low. Not documented in previous surveys but could occur in freshwater wetlands.
<i>Lilium occidentale</i> western lily	E/E/List 1B.1	Bogs and fens, Coastal bluff scrub, Coastal prairie, Coastal scrub, Marshes and swamps(freshwater), North Coast coniferous forest(openings)	Jun-Jul	Low. Not documented in previous surveys but could occur in freshwater wetlands.
<i>Pleuropogon refractus</i> nodding semaphore grass	-/-/List 4.2	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest, Riparian forest/mesic	Apr-Aug	Low. Not documented in previous surveys but could occur in riparian habitat adjacent to project area.
<i>Sidalcea malachroides</i> maple-leaved checkerbloom	-/-/List 4.2	Broadleaved upland forest, Coastal prairie, Coastal scrub, North Coast coniferous forest, Riparian woodland/often in disturbed areas	Apr-Aug	Low. Not documented in previous surveys but could occur in riparian habitat adjacent to project area.
Species whose habitat is not present in project area				
<i>Abronia umbellata</i> var. <i>Breviflora</i> pink sand-verbena	-/-/List 1B.1	Coastal dunes	Jun-Oct	None, no habitat present.

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
<i>Anomobryum julaceum</i> slender silver moss	-/-/List 2B.2	Broadleafed upland forest, Lower montane coniferous forest, North Coast coniferous forest/damp rock and soil on outcrops, usually on roadcuts	NA	None, no habitat present.
<i>Bryoria pseudocapillaris</i> false gray horsehair lichen	-/-/List 3.2	Usually on conifers in North Coast coniferous forest on the immediate coast and in coastal dunes in San Luis Obispo Cty	NA	None, no habitat present.
<i>Bryoria spiralifera</i> twisted horsehair lichen	-/-/List 1B.1	Usually on conifers in North Coast coniferous forest on the immediate coast	NA	None, no habitat present.
<i>Cardamine angulata</i> seaside bittercress	-/-/List 2B.1	Wet areas and streambanks in lower montane and North Coast coniferous forest	Mar-Jul	None, no habitat present.
<i>Carex arcta</i> northern clustered sedge	-/-/List 2B.2	Bogs and fens, mesic North Coast coniferous forest	Jun-Sep	None, no habitat present.
<i>Carex praticola</i> northern meadow sedge	-/-/List 2B.2	Mesic meadows and seeps	May-Jul	None, no habitat present.
<i>Castilleja litoralis</i> Oregon coast paintbrush	-/-/List 2.2	Coastal bluff scrub, Coastal dunes, Coastal scrub/sandy	Jun	None, no habitat present.
<i>Castilleja ambigua</i> var. <i>humboldtiensis</i> Humboldt Bay owl's-clover	-/-/List 1B.2	Marshes and swamps(coastal salt)	Apr-Aug	None, no salt marsh habitat present.
<i>Chloropyron maritimum</i> ssp. <i>palustre</i> Point Reyes salty bird's-beak	-/-/List 1B.2	Marshes and swamps(coastal salt)	Jun-Oct	None, no salt marsh habitat present.
<i>Clarkia amoena</i> ssp. <i>whitneyi</i>	-/-/List 1B.1	Coastal bluff scrub, Coastal scrub	Jun-Aug	None, no habitat

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
Whitney's farewell-to-spring				present.
<i>Collomia tracyi</i> Tracy's collomia	-/-/List 4.3	Lower montane coniferous forest	Jun-Jul	None, no habitat present.
<i>Erysimum menziesii</i> Menzies wallflower	E/E/List 1B.1	Coastal dunes	Mar-Apr	None, no habitat present.
<i>Erythronium revolutum</i> coast fawn lily	-/-/List 2B.2	Bogs and fens, Broadleaved upland forest, North Coast coniferous forest/mesic, streambanks	Mar-Jul(Aug)	None, no habitat present.
<i>Fissidens pauperculus</i> minute pocket moss	-/-/List 1B.2	North Coast coniferous forest (damp coastal soil)	NA	None, no habitat present.
<i>Gilia capitata ssp. Pacifica</i> Pacific gilia	-/-/List 1B.2	Coastal bluff scrub, Chaparral(openings), Coastal prairie, Valley and foothill grassland	Apr-Aug	None, no habitat present.
<i>Gilia millefoliata</i> dark-eyed gilia	-/-/List 1B.2	Coastal dunes	Apr-Jul	None, no habitat present.
<i>Glehnia littoralis ssp. leiocarpa</i> American glehnia	-/-/List 4.2	Coastal dunes	May-Aug	None, no habitat present.
<i>Hesperovax sparsiflora var. brevifolia</i> short-leaved evax	-/-/List 1B.2	Coastal bluff scrub(sandy), Coastal dunes	Mar-Jun	None, no habitat present.
<i>Hesperolinon adenophyllum</i> glandular western flax	-/-/List 1B.2	Chaparral, Cismontane woodland, Valley and foothill grassland/usually serpentinite	May-Aug	None, no habitat present.
<i>Lathyrus japonicas</i> seaside pea	-/-/List 2B.1	Coastal dunes	May-Aug	None, no habitat present.
<i>Layia carnosa</i> beach layia	E/E/List 1B.1	Coastal dunes, Coastal scrub(sandy)	Mar-Jul	None, no habitat present.

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
<i>Lilium kelloggii</i> Kellogg's lily	-/-/List 4.3	Openings and roadsides in lower montane and North Coast coniferous forest	May-Aug	None, no habitat present.
<i>Lilium rubescens</i> redwood lily	-/-/List 4.2	Sometimes serpentinite, sometimes roadsides in broadleafed upland forest, chaparral, lower and upper montane and North Coast coniferous forest	Apr-Sep	None, no habitat present.
<i>Listera cordata</i> heart-leaved twayblade	-/-/List 4.2	Bogs and fens, North Coast and lower montane coniferous forest	Feb-Jul	None, no habitat present.
<i>Lycopodium clavatum</i> running-pine	-/-/List 4.1	Edges, openings, and roadsides in mesic North Coast and lower montane coniferous forest, marshes and swamps	Jun-Sep	None. No habitat present.
<i>Mitellastrum caulescens</i> leafy-stemmed mitrewort	-/-/List 4.2	Mesic areas, sometimes roadsides, in Broadleafed upland forest, North Coast coniferous forest, lower montane coniferous forest, meadows and seeps.	Mar-Oct	None, no habitat present.
<i>Monotropa uniflora</i> ghost-pipe	-/-/List 2B.2	Broadleafed upland forest, North Coast coniferous forest.	Jun-Sep	None, no habitat present.

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
<i>Montia howellii</i> Howell's montia	-/-/List 2B.2	Meadows and seeps, North Coast coniferous forest, Vernal pools/vernally mesic, sometimes roadsides	Mar-May	None, no habitat present.
<i>Oenothera wolfii</i> Wolf's evening-primrose	-/-/List 1B.1	Coastal bluff scrub, Coastal dunes, Coastal prairie, Lower montane coniferous forest/sandy, usually mesic	May-Oct	None, no habitat present.
<i>Packera bolanderi</i> var. <i>bolanderi</i> seacoast ragwort	-/-/List 2B.2	Coastal scrub, North Coast coniferous forest/sometimes roadsides	(Feb-Apr)May-Jul	None, no habitat present.
<i>Puccinellia pumila</i> dwarf alkali grass	-/-/List 2.2	Marshes and swamps(coastal salt)	Jul	None, no salt marsh habitat present.
<i>Pityopus californica</i> California pinefoot	-/-/List 4.2	Broadleafed upland forest, upper and lower montane coniferous forest, North Coast coniferous forest.	Mar-Aug	None, no habitat present.
<i>Polemonium carneum</i> Oregon polemonium	-/-/List 2.2	Coastal prairie, Coastal scrub, Lower montane coniferous forest	Apr-Sep	None, no habitat present.
<i>Puccinellia pumila</i> dwarf alkali grass	-/-/List 2.2	Marshes and swamps(coastal salt)	Jul	
<i>Ribes laxiflorum</i> trailing black currant	-/-/List 4.3	North Coast coniferous forest/sometimes roadside	Mar-Jul(Aug)	None, no habitat present.
<i>Sidalcea malviflora</i> ssp. <i>patula</i> Siskiyou checkerbloom	-/-/List 1B.2	Coastal bluff scrub, Coastal prairie, North Coast coniferous forest/often roadcuts	May-Aug	None, no habitat present.

Scientific Name/ Common Name	Status (Fed/State/CNPS)	Habitat	Blooming Period	Probability of Occurring in Project Area
<i>Sidalcea oregana ssp. eximia</i> coast checkerbloom	-/-/List 1B.2	Lower montane coniferous forest, Meadows and seeps, North Coast coniferous forest	Jun-Aug	None, no habitat present.
<i>Spergularia canadensis var. occidentalis</i> western sand-spurrey	-/-/List 2B.1	Marshes and swamps(coastal salt)	Jun-Aug	None, no salt marsh habitat is present.
<i>Usnea longissima</i> long-beard lichen	-/-/List 4	Humid coniferous forests, usually where fog is frequent	NA	None, no habitat present.
<i>Viola palustris</i> alpine marsh violet	-/-/List 2B.2	Bogs and fens, coastal scrub	Mar-Aug	None, no habitat present.

Appendix 3. CalEEMod Air Quality Calculations

DRAFT

White Slough Restoration Humboldt County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Recreational	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Rural	Wind Speed (m/s)	2.2	Precipitation Freq (Days)	103
Climate Zone	1			Operational Year	2014
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	CH4 Intensity (lb/MWhr)	0.029	N2O Intensity (lb/MWhr)	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Land Use is Open Space. This area is part of the Humboldt Bay National Wildlife Refuge and will be managed for habitat, not for public access. The size of the project area is 40 acres.

Construction Phase - Construction is planned over two 120 day seasons, with site preparation occurring for two weeks before mass grading each season.

Off-road Equipment - Equipment list generated by Refuge staff.

Off-road Equipment - Other construction equipment= water truck

Off-road Equipment - Other construction equipment is water truck. Phase consists of import and grading of 90,000 cy of sediment and dike removal.

Off-road Equipment -

Trips and VMT - Hauling distance for importing fill is estimated at about 10 miles one way. With 120,000 cy to import and 20 cy trucks, 6,000 round trips or 12,000 trips total will be required in each of the two grading phases.

Grading - 40 acre site will be filled in two separate phases, approximately 90,000 cy and 20 ac each.

Vehicle Trips - Site will be part of Humboldt Bay National Wildlife Refuge managed for open space and will not generate ongoing trips after construction.

Woodstoves - No residential units will be part of the project.

Land Use Change -

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	0.00	122.00
tblConstructionPhase	NumDays	0.00	121.00
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	PhaseEndDate	4/1/2016	10/15/2016
tblConstructionPhase	PhaseEndDate	1/14/2015	4/28/2015
tblConstructionPhase	PhaseStartDate	10/16/2015	4/29/2016
tblConstructionPhase	PhaseStartDate	1/1/2015	4/15/2015
tblGrading	AcresOfGrading	45.75	20.00
tblGrading	AcresOfGrading	60.50	20.00
tblGrading	AcresOfGrading	5.00	40.00
tblGrading	MaterialImported	0.00	90,000.00
tblGrading	MaterialImported	0.00	90,000.00
tblOffRoadEquipment	HorsePower	162.00	81.00
tblOffRoadEquipment	HorsePower	162.00	81.00
tblOffRoadEquipment	LoadFactor	0.38	0.73
tblOffRoadEquipment	LoadFactor	0.38	0.73
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	3.00
tblOffRoadEquipment	UsageHours	1.00	6.00
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripLength	20.00	10.00
tblTripsAndVMT	HaulingTripLength	20.00	10.00
tblTripsAndVMT	HaulingTripNumber	8,899.00	12,000.00
tblTripsAndVMT	HaulingTripNumber	8,899.00	12,000.00
tblTripsAndVMT	WorkerTripNumber	25.00	30.00
tblTripsAndVMT	WorkerTripNumber	25.00	30.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.5794	5.2435	5.0472	5.6000e-003	0.9300	0.2522	1.1823	0.4773	0.2339	0.7112	0.0000	516.3523	516.3523	0.0822	0.0000	518.0785
2016	0.4027	3.4855	3.6519	4.6900e-003	0.2185	0.1692	0.3876	0.0957	0.1573	0.2530	0.0000	425.7557	425.7557	0.0560	0.0000	426.9319
Total	0.9821	8.7291	8.6991	0.0103	1.1485	0.4214	1.5699	0.5730	0.3912	0.9642	0.0000	942.1080	942.1080	0.1382	0.0000	945.0103

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2015	0.5794	5.2435	5.0472	5.6000e-003	1.3723	0.2522	1.6245	0.6971	0.2339	0.9310	0.0000	516.3520	516.3520	0.0822	0.0000	518.0781
2016	0.4027	3.4855	3.6519	4.6900e-003	0.3403	0.1692	0.5095	0.1436	0.1573	0.3009	0.0000	425.7554	425.7554	0.0560	0.0000	426.9317
Total	0.9821	8.7291	8.6991	0.0103	1.7126	0.4214	2.1340	0.8407	0.3912	1.2319	0.0000	942.1074	942.1074	0.1382	0.0000	945.0098

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N2O	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	-49.12	0.00	-35.93	-46.72	0.00	-27.76	0.00	0.00	0.00	0.00	0.00	0.00

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	0.0000	0.0000	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

2.3 Vegetation

Vegetation

	CO2e
Category	MT
Vegetation Land Change	0.0000
Total	0.0000

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2015	12/31/2014	5	0	
2	Building Construction	Building Construction	1/1/2015	12/31/2014	5	0	
3	Paving	Paving	1/1/2015	12/31/2014	5	0	
4	Architectural Coating	Architectural Coating	1/1/2015	12/31/2014	5	0	
5	Site Preparation	Site Preparation	4/15/2015	4/28/2015	5	10	Vegetation clearing
6	Grading I	Grading	4/29/2015	10/15/2015	5	122	
7	Grading II	Grading	4/29/2016	10/15/2016	5	121	

Acres of Grading (Site Preparation Phase): 40

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Demolition	Rubber Tired Dozers	1	1.00	255	0.40
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Construction	Cranes	1	4.00	226	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Paving	Pavers	1	7.00	125	0.42
Paving	Rollers	1	7.00	80	0.38
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Architectural Coating	Air Compressors	1	6.00	78	0.48
Site Preparation	Graders	1	8.00	174	0.41
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Grading I	Concrete/Industrial Saws	1	8.00	81	0.73
Grading I	Excavators	2	8.00	81	0.73
Grading I	Graders	1	6.00	174	0.41
Grading I	Other Construction Equipment	1	4.00	171	0.42
Grading I	Rubber Tired Dozers	3	6.00	255	0.40
Grading I	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading II	Concrete/Industrial Saws	1	8.00	81	0.73
Grading II	Excavators	2	8.00	81	0.73
Grading II	Graders	1	8.00	174	0.41
Grading II	Other Construction Equipment	1	6.00	171	0.42
Grading II	Rubber Tired Dozers	3	1.00	255	0.40
Grading II	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading I	10	30.00	0.00	12,000.00	16.80	6.60	10.00	LD_Mix	HDT_Mix	HHDT
Grading II	10	30.00	0.00	12,000.00	16.80	6.60	10.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

- Use Soil Stabilizer
- Replace Ground Cover
- Water Exposed Area
- Reduce Vehicle Speed on Unpaved Roads

3.6 Site Preparation - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0212	0.0000	0.0212	2.2900e-003	0.0000	2.2900e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1100e-003	0.0715	0.0370	5.0000e-005		4.4000e-003	4.4000e-003		4.0500e-003	4.0500e-003	0.0000	4.4659	4.4659	1.3300e-003	0.0000	4.4939
Total	7.1100e-003	0.0715	0.0370	5.0000e-005	0.0212	4.4000e-003	0.0256	2.2900e-003	4.0500e-003	6.3400e-003	0.0000	4.4659	4.4659	1.3300e-003	0.0000	4.4939

3.6 Site Preparation - 2015

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	3.4000e-004	2.7900e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2737	0.2737	2.0000e-005	0.0000	0.2742
Total	1.9000e-004	3.4000e-004	2.7900e-003	0.0000	3.0000e-004	0.0000	3.0000e-004	8.0000e-005	0.0000	8.0000e-005	0.0000	0.2737	0.2737	2.0000e-005	0.0000	0.2742

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0308	0.0000	0.0308	3.3200e-003	0.0000	3.3200e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	7.1100e-003	0.0715	0.0370	5.0000e-005		4.4000e-003	4.4000e-003		4.0500e-003	4.0500e-003	0.0000	4.4659	4.4659	1.3300e-003	0.0000	4.4939
Total	7.1100e-003	0.0715	0.0370	5.0000e-005	0.0308	4.4000e-003	0.0352	3.3200e-003	4.0500e-003	7.3700e-003	0.0000	4.4659	4.4659	1.3300e-003	0.0000	4.4939

3.6 Site Preparation - 2015

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.9000e-004	3.4000e-004	2.7900e-003	0.0000	5.6000e-004	0.0000	5.6000e-004	1.4000e-004	0.0000	1.5000e-004	0.0000	0.2737	0.2737	2.0000e-005	0.0000	0.2742
Total	1.9000e-004	3.4000e-004	2.7900e-003	0.0000	5.6000e-004	0.0000	5.6000e-004	1.4000e-004	0.0000	1.5000e-004	0.0000	0.2737	0.2737	2.0000e-005	0.0000	0.2742

3.7 Grading I - 2015

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.8371	0.0000	0.8371	0.4555	0.0000	0.4555	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3858	3.9698	2.7871	2.9700e-003		0.2285	0.2285		0.2121	0.2121	0.0000	279.8101	279.8101	0.0773	0.0000	281.4327
Total	0.3858	3.9698	2.7871	2.9700e-003	0.8371	0.2285	1.0656	0.4555	0.2121	0.6675	0.0000	279.8101	279.8101	0.0773	0.0000	281.4327

3.7 Grading I - 2015**Unmitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1723	1.1767	2.0161	2.3200e-003	0.0495	0.0191	0.0686	0.0136	0.0176	0.0312	0.0000	211.7682	211.7682	2.0000e-003	0.0000	211.8102
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0252	0.2042	2.6000e-004	0.0219	2.3000e-004	0.0222	5.8500e-003	2.1000e-004	6.0600e-003	0.0000	20.0344	20.0344	1.5800e-003	0.0000	20.0676
Total	0.1863	1.2019	2.2203	2.5800e-003	0.0714	0.0194	0.0908	0.0195	0.0178	0.0373	0.0000	231.8026	231.8026	3.5800e-003	0.0000	231.8778

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					1.2139	0.0000	1.2139	0.6604	0.0000	0.6604	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.3858	3.9698	2.7871	2.9700e-003		0.2285	0.2285		0.2121	0.2121	0.0000	279.8098	279.8098	0.0773	0.0000	281.4323
Total	0.3858	3.9698	2.7871	2.9700e-003	1.2139	0.2285	1.4423	0.6604	0.2121	0.8725	0.0000	279.8098	279.8098	0.0773	0.0000	281.4323

3.7 Grading I - 2015**Mitigated Construction Off-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1723	1.1767	2.0161	2.3200e-003	0.0863	0.0191	0.1055	0.0227	0.0176	0.0403	0.0000	211.7682	211.7682	2.0000e-003	0.0000	211.8102
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0140	0.0252	0.2042	2.6000e-004	0.0408	2.3000e-004	0.0411	0.0105	2.1000e-004	0.0107	0.0000	20.0344	20.0344	1.5800e-003	0.0000	20.0676
Total	0.1863	1.2019	2.2203	2.5800e-003	0.1272	0.0194	0.1465	0.0332	0.0178	0.0510	0.0000	231.8026	231.8026	3.5800e-003	0.0000	231.8778

3.8 Grading II - 2016**Unmitigated Construction On-Site**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1472	0.0000	0.1472	0.0763	0.0000	0.0763	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2499	2.4462	1.6382	2.1300e-003		0.1547	0.1547		0.1440	0.1440	0.0000	197.4498	197.4498	0.0529	0.0000	198.5605
Total	0.2499	2.4462	1.6382	2.1300e-003	0.1472	0.1547	0.3019	0.0763	0.1440	0.2202	0.0000	197.4498	197.4498	0.0529	0.0000	198.5605

3.8 Grading II - 2016

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.1405	1.0172	1.8342	2.3100e-003	0.0495	0.0143	0.0637	0.0136	0.0131	0.0268	0.0000	209.1610	209.1610	1.7100e-003	0.0000	209.1969
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0124	0.0222	0.1795	2.6000e-004	0.0218	2.1000e-004	0.0220	5.8000e-003	2.0000e-004	5.9900e-003	0.0000	19.1449	19.1449	1.4100e-003	0.0000	19.1744
Total	0.1528	1.0393	2.0137	2.5700e-003	0.0712	0.0145	0.0857	0.0194	0.0133	0.0327	0.0000	228.3059	228.3059	3.1200e-003	0.0000	228.3714

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.2135	0.0000	0.2135	0.1106	0.0000	0.1106	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.2499	2.4462	1.6382	2.1300e-003		0.1547	0.1547		0.1440	0.1440	0.0000	197.4495	197.4495	0.0529	0.0000	198.5603
Total	0.2499	2.4462	1.6382	2.1300e-003	0.2135	0.1547	0.3682	0.1106	0.1440	0.2546	0.0000	197.4495	197.4495	0.0529	0.0000	198.5603

4.2 Trip Summary Information

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Recreational	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

Land Use	Miles			Trip %			Trip Purpose %		
	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Recreational	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.426523	0.105926	0.174399	0.133272	0.086833	0.009312	0.012860	0.034780	0.002240	0.001641	0.007868	0.001317	0.003029

5.0 Energy Detail

~~4.4 Fleet Mix~~

Historical Energy Use: N

5.1 Mitigation Measures Energy

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e	
Land Use	kBTU/yr	tons/yr										MT/yr						
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000								

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Recreational	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Recreational	0	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type
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10.0 Vegetation

	Total CO2	CH4	N2O	CO2e
Category	MT			
Unmitigated	0.0000	0.0000	0.0000	0.0000

10.1 Vegetation Land Change

Vegetation Type

	Initial/Final	Total CO2	CH4	N2O	CO2e
	Acres	MT			
Wetlands	40 / 40	0.0000	0.0000	0.0000	0.0000
Total		0.0000	0.0000	0.0000	0.0000

Mitigation, Monitoring and Reporting Plan for White Slough Restoration Project

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
<p>MITIGATION 4A-1: Limited Construction Season. Construction will only occur between July 1st and October 31st when freshwater discharge from Chisum Creek is at its lowest and when the ground surface is dry and to reduce the chance of stormwater runoff occurring during construction.</p>	USFWS	USFWS	SCC	During construction
<p>MITIGATION 4A-2: Fish and Amphibian Relocation. Installation of temporary block nets or fish screens in the tidal channels and Chisum Creek will occur prior to all diversions or dewatering of any wetted channels, where work is to occur, to isolate and facilitate relocating any fish or amphibians. Relocation of fish and amphibians using electrofishing, seines, and dipnets will be coordinated with DFW, Refuge, NMFS, and USFWS staff as appropriate. During, and immediately after de-watering an authorized fish biologist will conduct a survey of the areas being de-watered for stranded fish or amphibians. Any stranded fish or amphibians shall be collected, recorded, and relocated to adjacent waters with appropriate habitat conditions.</p>	USFWS	USFWS	SCC	Before diversion or dewatering of wetted channels
<p>MITIGATION 4A-3: Dewatering limits and fish screening. Aquatic habitat will be de-watered for the shortest time necessary to complete construction or excavation. Pumps used to de-water work areas will utilize a fish screen on the inlet of sufficiently sized mesh to prevent entrainment of TWG or salmonids.</p>	USFWS	USFWS	SCC	Before and during diversion or dewatering of wetted channels
<p>MITIGATION 4A-4: Construction limits in wetlands. Construction activities in the seasonal wetlands in the West Unit Area will occur only when the area is dry and when adult red-legged frogs are not expected to be present.</p>	USFWS	USFWS	SCC	During construction
<p>MITIGATION 4A-5: Northwestern Pond Turtle Surveys. Northwestern</p>	USFWS	USFWS	SCC	Two weeks

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
<p>pond turtle surveys will be carried out by a qualified biologist along stream or pond margins two weeks prior to commencement of ground disturbing activities. Surveys will be utilized to locate and flag northwestern pond turtle nests with eggs, or to remove hatchlings and adults that may be present in the stream reach above the existing tidal zone. Any active nests located will left undisturbed until hatchlings have emerged or have been relocated to suitable areas outside of the area of disturbance, similarly relocation of any adults found will occur.</p>				<p>prior to ground disturbance</p>
<p>MITIGATION 4A-6: Bird Surveys. Surveys by a qualified biologist for nesting birds in riparian areas and 1,000 feet beyond the limits of disturbance, will occur two weeks prior to commencement of ground-disturbing activities. If breeding is confirmed of any birds of special status, construction activities that would degrade or remove breeding habitat will not occur in the immediate vicinity until the end of the breeding period for that species or until the breeding effort has either been determined to have failed or the young have been determined to have fledged.</p>	<p>USFWS</p>	<p>USFWS</p>	<p>SCC</p>	<p>Two weeks prior to ground disturbance</p>
<p>MITIGATION 4A-7: Minimize impacts to special status plant species. A qualified botanist will survey for the 9 plant species of concern in the Project Area. If such plants are found, populations will be mapped and flagged, and avoided if possible. If populations of these plants cannot be avoided during excavation or grading they will be removed as “wafers” (top 12 inches of vegetation/topsoil) and either transplanted immediately or stored separately on pond liners. These soils will be kept moist until they are re-placed at the appropriate finished grade and in the same orientation, or transplanted to another area of suitable habitat on the Refuge.</p>	<p>USFWS</p>	<p>USFWS</p>	<p>SCC</p>	<p>Flowering season for the species in question before construction (March-June)</p>
<p>MITIGATION 4A-8: Minimize disturbance to wetlands, riparian vegetation, and open water habitats. Disturbance of perennial wetlands, riparian vegetation, and open water habitats shall not exceed the minimum necessary to complete construction activities.</p>	<p>USFWS</p>	<p>USFWS</p>	<p>SCC</p>	<p>During construction. Delineation of exclusion areas prior to</p>

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
				treatment.
MITIGATION 4A-9: Avoid impacts to eelgrass: Vegetative disturbance will be contained within the limits of grading and kept to a minimum area.	USFWS	USFWS	SCC	During construction.
MITIGATION 4A-10: Water Quality Protection To minimize disturbances to the existing marsh, work will be phased as described in the Project Description. If required, dewatering will be performed to limit work to dry areas. Construction best management practices will be followed to prevent sediment entering open waterways.	USFWS	USFWS	SCC	During construction.
MITIGATION 7A-1: Equipment Maintenance: Heavy equipment that will be used in the Project will be in good condition and will be inspected for leakage of coolant and petroleum products and repaired, if necessary, before work is started.	Contractor	USFWS	SCC	Prior to and during construction.
MITIGATION 7A-2: Operator Training: Equipment operators will be trained in the procedures to be taken should an accident occur.	Contractor	USFWS	SCC	Prior to and during construction
MITIGATION 7A-3: Spill Response Plan. Prior to the onset of work the contractor will prepare a plan for the prompt and effective response to any accidental spills.	Contractor	USFWS	SCC	Prior to construction
MITIGATION 7A-4: Spill Absorption. Absorbent materials designed for spill containment and cleanup will be kept at that Project site for use in case of an accidental spill.	Contractor	USFWS	SCC	During construction
MITIGATION 7A-5: Drip pans. Stationary equipment will be positioned over drip pans.	Contractor	USFWS	SCC	During construction
MITIGATION 7A-6: Spark arrestors. All internal combustion engines shall be fitted with spark arrestors.	Contractor	USFWS	SCC	During construction
MITIGATION 7A-7: Fire-fighting equipment. The contractor shall have appropriate fire extinguishers and fire fighting tools present at all times when there is a risk of fire.	Contractor	USFWS	SCC	During construction
Mitigation 7A-8: Vehicle Parking. Vehicles shall not be parked in tall grass or any other location where heat from the exhaust system could ignite a fire.	Contractor	USFWS	SCC	During construction

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
MITIGATION 8A-1: Stockpiling restrictions. Excavated materials shall not be stockpiled overwinter. Sediment control measures shall be in place while materials are being stockpiled to minimize sediment and pollutant transport from the Project site.	Contractor	USFWS	SCC	During construction
MITIGATION 8A-2: Restrictions on placement of fill. Placement of fill in the Project Area will occur when the area is not inundated by tide water.	Contractor	USFWS	SCC	During construction
MITIGATION 8A-3: Handling of saturated soils. Excavation shall include handling of saturated soils. Saturated soils shall be dewatered and/or transported saturated in a manner that prevents excess discharge or spillage of soils or water within the construction access areas. A silt fence will be installed around the perimeter of temporary stockpiles of saturated soils to prevent runoff from leaving the site.	Contractor	USFWS	SCC	During construction
MITIGATION 8A-4: Silt fence. During construction a silt fence will be deployed to isolate work areas from existing channels, and to trap suspended sediment that might leave the construction site if stormwater runoff were to occur. If the silt fence is not adequately containing sediment, the construction activity shall cease until remedial measures are implemented that prevent sediment from entering the waters below.	Contractor	USFWS	SCC	During construction
MITIGATION 8A-5: Materials storage. No construction materials, debris, or waste, shall be placed or stored where it may be allowed to enter into or be placed where it may be washed by rainfall into waters of the U.S./State.	Contractor	USFWS	SCC	During construction
MITIGATION 8A-6: Erosion control measures. Following completion of excavation, placement of fill, and grading all ground to the limits of disturbance (except newly constructed streambeds, pond beds, and tidally inundated areas) shall be treated for erosion prior to the onset of precipitation capable of generating run-off or the end of the yearly work period, whichever comes first. Treated areas not exposed to tidal influence will be mulched with at least 2 to 4 inches of certified weed-free straw mulch with wheat or other straw for riparian and wetland	Contractor	USFWS	SCC	During construction

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
<p>areas and rice straw for uplands and use of a seed mix with coverage equivalent to 100 lbs/acre of barley seed and appropriate riparian vegetation for immediate erosion control. No annual (Italian) ryegrass (<i>Lolium multiflorum</i>) shall be used. In places such as stream banks, rush mattresses will be installed for immediate erosion control.</p>				
<p>MITIGATION 8A-7: Material removal after construction. All temporary fill, synthetic mats and silt fences will be removed from wetlands and waters of the U.S./State immediately on cessation of construction. Biodegradable geotextile fabrics will be used, where possible.</p>	Contractor	USFWS	SCC	During construction
<p>MITIGATION 8A-8: Stockpile protection. Soil and material stockpiles shall be properly protected to minimize sediment and pollutant transport from the construction site.</p>	Contractor	USFWS	SCC	During construction
<p>MITIGATION 8A-9: Stormwater BMPs. The following BMPs shall be implemented to prevent entry of storm water runoff into the excavation site, the entrainment of excavated contaminated materials leaving the site, and to prevent the entry of polluted storm water runoff into coastal waters during the transportation and storage of excavated contaminated materials:</p> <p>EC-2 Preservation of Existing Vegetation; EC-6 Straw Mulch; EC-7 Geotextile and Mats; EC-9 Earth Dikes and Drainage Swales; EC-10 Velocity Dissipation Devices; SE-1 Silt Fence; NS-2 Dewatering Operations; NS-4 Temporary Stream Crossing; NS-5 Clear Water Diversion; WM-9 Sanitary/Septic Waste Management</p>	Contractor	USFWS	SCC	During construction
<p>MITIGATION 8A-10: Stream diversion and dewatering BMPs. Stream diversion and dewatering shall conform to the following BMPs:</p> <p>NS-2 Dewatering Operations; NS-5 Clear Water Diversion; EC-9 Earth Dikes and Drainage Swales; EC-10 Velocity Dissipation Devices</p>	Contractor	USFWS	SCC	During construction
<p>MITIGATION 11A-1: Hearing protection. Workers will be required to</p>	Contractor	USFWS	SCC	During

Mitigation	Implementing Responsibility	Monitoring Responsibility	Reporting Responsibility	Timing
wear hearing protection when in the vicinity of or while operating equipment producing noise levels equal to or greater than 85 db.				construction
<p>MITIGATION 11A-2. Restrict noise from earthmoving and hauling of soils. Hours of construction for outdoor activities exceeding 50 dBA shall be limited to Monday through Friday 7:00 a.m. to 7:00 p.m. and weekends and holidays from 9:00 a.m. to 6:00 p.m. Movement and hauling of material, and associated activities such as re-fueling or maintenance, shall be limited to normal working hours for the area, as specified above. More restrictive operation hours may be specified in the construction documents and may be property-specific. If sediment is transported from Samoa, it may be necessary to haul material after 7:00 p.m. or before 7:00 a.m. to minimize traffic impacts. Hauling outside of the designated hours above will be minimized to the extent feasible.</p> <p>All equipment shall operate with factory-equipped mufflers, and staging areas shall be located as far from residential uses as is practical. These conditions shall be incorporated into project contract specifications. A haul-truck route plan shall be developed. Hauling shall minimize passing any substantial collection of noise-sensitive land uses (i.e. occupied houses, schools, hospitals).</p> <p>Larger capacity belly and end-dump trucks as well as double-trailers shall be used whenever feasible to minimize the number of truck trips necessary.</p> <p>Construction personnel shall conduct all work activities in a manner that minimizes noise generation. A variety of contractor actions are available that will reduce construction noise, including: i) turning off engines on all construction equipment not in active use, ii) shielding noisy equipment with less noisy equipment, and iii) avoiding high RPM engine operation whenever possible.</p>	Contractor	USFWS	SCC	During construction