California State Coastal Conservancy – Lead Agency

Eel River Estuary and Centerville Slough Enhancement Project

Draft Environmental Impact Report

SCH # 2014122040

Volume I of II

September 2016

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Draft Environmental Impact Report for the

Eel River Estuary and Centerville Slough Enhancement Project

SCH # 2014122040

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Project Ref#: 1000298-8410882

September 2016

Dedicated to the memory

and life's work of Gordon Becker.

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Acronyms and Abbreviations

AAI	all appropriate inquiries
AB	Assembly Bill
AE	Agriculture Exclusive
AG	Agriculture Grazing
AMP	Adaptive Management Program
APN	Assessor Parcel Number
ARG	Agricultural Supply
ASTM	American Society for Testing and Materials
ASTs	aboveground storage tanks
AUM	Animal Unit Months
BAAQMD	Bay Area Air Quality Management District
bgs	below ground surface
BMPs	Best Management Practices
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
Cal/EPA	California Environmental Protection Agency
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CE	Common Era
CERCLA	Comprehensive Environmental Response, Compensation and Liability
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFCPA	California Farmland Conservancy Program Act
CFGC	California Fish and Game Code
CFR	Code of Federal Regulations
CGC	Centerville Gun Club
CGS	California Geological Survey
CH_4	methane
CHP	California Highway Patrol
CHRIS	California Historical Resources Information System
CHSC	California Health and Safety Code
CIFF	California Important Farmland Finder
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNPPA	California Native Plant Protection Act
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO_2	carbon dioxide
$CO2_e$	carbon-dioxide-equivalent
COLD	Cold Freshwater Habitat
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank

CUP	Conditional Use Permit
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CY	cubic yard
dB	decibel
dBA	A-weighted sound level
DOC	California Department of Conservation
DOT	U.S. Department of Transportation
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EC	electrical conductivity
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EO	Executive Order
EOC	County Emergency Operations Center
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
ERAP	Eel River Area Plan
EREP	Eel River Estuary Preserve
ERGC	Eel River Gun Club
ERWA	Eel River Waterfowl Association
ESA	Environmental Site Assessment
ESA	Federal Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
ESP	exchangeable sodium percentage
Fed/OSHA	Federal Occupational Safety and Health Administration
FEMA	Federal Emergency Management Agency
FFPD	Ferndale Fire Protection District
FMMP	Farmland Mapping and Monitoring Program
FPPA	Federal Farmland Protection Policy Act
FSZ	Farmland Security Zone
Ft/s	feet per second
FVFD	Ferndale Volunteer Fire Department
GHG	Greenhouse Gas
GIS	Geographic Information System
gpm	gallons per minute
GSA	groundwater sustainability agency
HAZWOPER	Hazardous Waste Operations and Emergency Response
HBSLRAP	Humboldt Bay Sea Level Rise Adaption Planning
HCAOG	Humboldt County Association of Governments
HCGP	Humboldt County General Plan
HCRCD	Humboldt County Resource Conservation District
H_2O	water vapor
HTA	Humboldt Transit Authority
LCC	Land capability classification
LCP	Local Coastal Program
Ldn	Day/Night Average Sound Level
Leq	Equivalent Noise Level
LESA	Land Evaluation and Site Assessment
Lmax	maximum A-weighted noise level
Lmin	minimum A-weighted noise level
LOS	Level of Service
LRA	Local Responsibility Area
MAR	marine

MBTA	Migratory Bird Treaty Act
ml	milliliter
MMT	million metric tons
msl	mean sea level
MTR	muted tidegate regulator
MUN	municipal supply
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NCRWQCB	North Coast Regional Water Quality Control Board
NCUAQMD	North Coast Unified Air Quality Management District
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
N_2O	nitrous oxide
NO_2	Nitrogen Dioxide
NOAA	National Oceanic Atmospheric Administration
NOP	Notice of Preparation
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NR	Natural Resources
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NWIC	Northwest Information Center
O^3	ozone
OES	Office of Emergency Services
OHV	Off-highway vehicle
OMR	Office of Mine Reclamation
ORF	O'Rourke Foundation
ORV	off road vehicle
PDM	Production of Dry Residual Matter
PEIR	Programmatic Environmental Impact Report
PGA	peak ground acceleration
PG&E	Pacific Gas & Electric
PM	Particulate Matter
PPM	parts per million
PPT	part per thousand
PPV	Peak Particle Velocity
PRC	Public Resources Code
RCAA	Russ Creek Avulsion Area
RCD	Resource Conservation District
REC-1	Contact Water Recreation
RECs	recognized environmental conditions
RMS	Root Mean Square
ROG	reactive organic gases
RR&T	Russ Ranch & Timber
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement
SAL	saline
SAR	sodium adsorption ratio
SARA	Superfund Amendment and Reauthorization Act
SCC	State Coastal Conservancy

SGMA	Sustainable Groundwater Management Act
SHELL	Shellfish Harvesting
SLR	Sea Level Rise
SMAO	Streamside Management Area Ordinance
SMARA	Surface Mining and Reclamation Act
SMGB	State Mining and Geology Board
SREP	Salt River Ecosystem Restoration Project
SRWC	Salt River Watershed Council
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TP	Timber Production
TDS	Total Dissolved Solids
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily loads
TWC	The Wildlands Conservancy
UBC	Uniform Building Code
USACE	U.S. Army Corps of Engineers
USDA	United State Department of Agriculture
U.S. EPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	underground storage tank
VdB	velocity decibels
WARM	Warm Freshwater Habitat
WBWG	Western Bat Working Group
WDD	Western Drainage Ditch
WLMP	Water Level Management Plan
WRE	Wetland Reserve Easement

1. Introduction and Summary

1.1 California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that discretionary decisions by public agencies be subject to environmental review. The purpose of an Environmental Impact Report (EIR) is to identify the significant effects of the Project on the environment, to identify alternatives to the Project, and to indicate the manner in which those significant effects can be mitigated or avoided (Section 21002.1[a]). Each public agency is required to mitigate or avoid the significant effects on the environment of Projects it approves or carries out whenever it is feasible. Environmental effects of the Project that must be addressed include the significant effects of the Project, growth-inducing effects of the Project, and significant cumulative effects of past, present, and reasonably anticipated future Projects.

This Draft EIR has been prepared by the California State Coastal Conservancy for the proposed Eel River Estuary and Centerville Slough Enhancement Project (Project) pursuant to the CEQA of 1970 (Public Resources Code Section 21000 et seq.) and the CEQA Guidelines (California Code of Regulations Section 15000 et seq.). The purpose of an EIR is not to recommend either approval or denial of a Project. CEQA requires decision-makers to balance the benefits of a Project against its unavoidable environmental effects in deciding whether to carry out a Project. The lead agency will consider the Draft EIR, comments received on the Draft EIR, and responses to those comments before making a final decision. If significant environmental effects are identified, the lead agency must adopt “Findings” indicating whether feasible mitigation measures or alternatives exist that can avoid or reduce those effects. If significant environmental impacts are identified as significant and unavoidable after proposed mitigation, the lead agency may still approve the Project if it determines that the social, economic, or other benefits outweigh the unavoidable impacts. The lead agency would then be required to prepare a “Statement of Overriding Considerations” that discusses the specific reasons for approving the Project, based on information in the EIR and other information in the administrative record.

1.2 Type of Environmental Impact Report

This EIR is a Project EIR, pursuant to State CEQA Guidelines Section 15161. A Project EIR is the most common type of EIR, examining the environmental impacts of a specific development. This type of EIR focuses on the changes in the environment that would result from the construction, development, and ultimate operation of a Project.

1.3 Intended Uses of the EIR

The purpose of an EIR is to provide a clear understanding of the environmental impacts associated with the construction and operation of a Project that is proposed by a public agency or private interest. EIRs are prepared to meet the requirements of the CEQA when a proposed Project may have a “significant” impact on the physical environment. An EIR is defined by the State CEQA Guidelines as “… a detailed statement prepared to describe and analyze significant environmental effects of a Project and discuss ways to mitigate or avoid the effects.” An EIR must include a description of the physical environmental conditions in the vicinity of the Project, as they exist at the time the Notice of Preparation (NOP) is published, from both a local and regional perspective. This environmental setting normally constitutes the baseline physical conditions by which the lead

agency determines whether an impact is significant. The EIR is used by decision-makers, responsible and trustee agencies, and the public to understand and evaluate Project proposals and assist in making decisions on Project approvals and required permits.

An EIR is an informational document used in the planning and decision-making process by the lead agency and responsible and trustee agencies. EIRs are prepared under the direction of a lead agency. The lead agency is the decision-making body that will ultimately certify the adequacy of the EIR and approve the implementation of a Project. The lead agency for the proposed Project is the California State Coastal Conservancy.

In addition to the lead agency, other responsible and trustee agencies may need to use this document in approving permits or providing recommendations for the Project. These agencies include, but are not limited to:

- County of Humboldt – Conditional Use Permit and Grading Permit
- California Coastal Commission – Coastal Development Permit
- California Department of Fish & Wildlife – Lake and Streambed Alteration Agreement , Incidental Take or Consistency Determination Process, and Consistency Determination for Salmonids with NMFS Biological Opinion
- North Coast Regional Water Quality Control Board – 401 Water Quality Certification
- U.S. Army Corps of Engineers – Clean Water Act Section 404
- Formal Consultation – USFWS and NOAA Fisheries
- California State Lands Commission – Lease of State Lands

1.4 Public Scoping Process

On December 17, 2014, the Coastal Conservancy issued the original NOP for the original version of the Project. The original NOP was issued in accordance with the State CEQA Guidelines (14 California Code of Regulations [CCR] Section 15082) with the intent of informing agencies and interested parties that an EIR would be prepared for the above-referenced Project. The original NOP was circulated between December 17, 2014 and January 16, 2015. A public scoping meeting for the proposed Project was held in Fortuna January 12, 2015 at 3:00 P.M. The Coastal Conservancy received extensive input on the proposed Project, but the comments received did not warrant reissuance of the original NOP or rescoping. However, in August 2015 adjacent property owners requested that the Project scope extend beyond the Eel River Estuary Preserve (EREP) to include adjacent properties.

In response to input received during the initial scoping, as well as more recent stakeholder interest and input, the Project has since been revised by the applicants (TWC and RR&T). The Project area now includes approximately 600-acres to the south of the EREP. This expanded footprint is extended at the request of adjacent property owners and similar Project components are proposed for implementation on these adjacent properties. To address the addition of these properties into the Project area, the Coastal Conservancy prepared a Revised NOP (Appendix A) to allow for additional public and agency comment on the preparation of this EIR for the revised proposed Project. The Revised NOP was circulated between November 13, 2015 and December 18, 2015. A public scoping meeting for the Revised NOP proposed Project was held at the Fortuna River Lodge on December 9, 2015. Comments provided in response to both the original and the Revised NOP have been considered and addressed in this Draft EIR and are included in Appendix B.

1.5 Effects Found Not to be Significant

To provide more meaningful public disclosure, reduce the time and cost required to prepare an EIR, and focus on potentially significant effects on the environment of a proposed Project, lead agencies shall, in accordance with Section 21100, focus the discussion in the EIR on those potential effects on the environment of a proposed Project which the lead agency has determined are or may be significant. Lead agencies may limit discussion on other effects to a brief explanation as to why those effects are not potentially significant (Public Resources Code Section 21002.1 (e); CEQA Guidelines Sections 15128 and 15143). Each resource category section in Chapter 3 includes a section titled "Areas of No Project Impact" where applicable. Information used to determine which impacts would be potentially significant was derived from a review of the Project, field work, feedback from agency consultation and input, and comments received on the NOP.

1.6 Availability of the Draft EIR and Public Comment Period

The Draft EIR will be circulated for 45 days, from September 8, 2016 to October 24, 2016, to allow interested individuals and public agencies to review and comment on the document. The document is available for review at the California State Coastal Conservancy, located at 1330 Broadway, 13th Floor, Oakland, California; at www.scc.ca.gov; and at http://scc.ca.gov/2014/12/19/eel-river-estuary-centerville-slough-enhancement-project/. Document files will also be made available upon request at GHD, 718 Third Street, Eureka, California. Written comments on the Draft EIR will be accepted by the California State Coastal Conservancy (Lead Agency) until 5:00 pm on October 24, 2016. Public agencies, interested organizations and individuals are encouraged to submit comments on the Draft EIR for consideration by the California State Coastal Conservancy. All written comments should be addressed to:

Michael Bowen, Project Manager
California State Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612-2530
Email: Michael.Bowen@scc.ca.gov

To facilitate understanding of the comments, please provide a separate sentence or paragraph for each comment, and note the page and chapter/section of the Draft EIR to which the comment is directed. This approach to commenting will help the California State Coastal Conservancy to provide a clear and meaningful response to each comment. The Draft EIR is available for review at the address above.

A public hearing is scheduled for purposes of receiving public comments on the Draft EIR on September 28, 2016 at or after 6:00 p.m. at the Fortuna River Lodge Conference Center, 1800 Riverwalk Drive, Fortuna, California.

At the end of the public review period, written responses will be prepared for comments received on the Draft EIR during the circulation period. The comments and responses will then be included in the Final EIR and will be considered by the lead agency prior to consideration of the adequacy of the EIR. Prior to approval of the Project, the lead agency must certify that the EIR has been completed in compliance with CEQA.

1.7 Organization of this Environmental Impact Report

This Draft EIR is organized into chapters, as identified and briefly described below. Chapters are further divided into sections (e.g., Section 3.1, Aesthetics).

- **Chapter 1, Introduction and Summary.** Chapter 1 describes the purpose and organization of the Draft EIR, context, and terminology used in the Draft EIR. This chapter also identifies the key issues to be resolved in the EIR and summarizes the environmental impacts, and mitigation measures to reduce or eliminate those impacts.
- **Chapter 2, Project Description.** Chapter 2 describes the Project overview and objectives, Project location and setting, background, overall concept, proposed Project activities, and anticipated permits and approvals.
- **Chapter 3, Environmental Setting, Impacts and Mitigation Measures.** For each environmental resource area, this chapter describes the existing environmental and regulatory setting, discusses the environmental impacts associated with the proposed Project, identifies feasible mitigation measures to reduce or eliminate those impacts, and provides conclusions on significance.
- **Chapter 4, Alternatives.** This chapter describes the alternatives to the proposed Project that are being considered to mitigate the Project's environmental impacts while meeting most of the Project's objectives.
- **Chapter 5, Other CEQA Related Impacts.** This chapter describes the unavoidable significant impacts, growth-inducing, and irreversible impacts of the proposed Project.
- **Chapter 6, Report Preparation.** This chapter identifies the Draft EIR authors and consultants who provided analysis in support of the Draft EIR's conclusions.
- **Appendices.** The appendices contain various technical reports, and publications that have been summarized or otherwise used for preparation of the Draft EIR.

1.8 Areas of Controversy and Key Issues to be Resolved

Section 15123 of the CEQA Guidelines requires an EIR to identify areas of controversy known to the Lead Agency, including issues raised by agencies and the public. The comment letters received on the NOP are included in Appendix B of this document. The following provides a brief summary of the comments/issues raised in comment letters and emails received on the NOP and during the public scoping meeting.

- Queries of appropriate databases to identify any special-status species and consultation with applicable agencies such as California Department of Fish and Wildlife (CDFW) and U.S. Fish and Wildlife Service (USFWS)
- Invasive species management
- Evaluation of noise and vibration impacts on species
- Identification and mitigation of any unknown cultural resources underground and submerged under water, and the inclusion of a records search and cultural resources investigation
- Analysis of sea level rise through enhanced floodplain drainage, capacity, open space, etc.
- Information and analysis of the hydrology of the area, past and present
- Inland dune migration and management

- Project's potential impacts to agricultural resources in the Project area
- Recreational use and a disputed easement to the EREP
- Retrofitted tidegates and their potential benefits and/or potential effects
- Impact of the Project on recreation including waterfowl hunting
- Increased traffic in the Project vicinity

All of the substantive environmental issues raised in the NOP comment letters and emails have been addressed in this Draft EIR.

1.9 Summary of Impacts and Proposed Mitigation Measures

Table 1-1 identifies, by resource category, the significant Project impacts and proposed mitigation measures, and post-mitigation significance. Additional information about the impacts and mitigation measures can be found in Chapter 3 of this EIR, as referenced for each resource category.

Table 1-1 Summary of Impacts and Mitigation Measures

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Aesthetics			
Impact AES-1: Would the Project have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character of the site and surroundings.	Less than Significant	n/a	
Impact AES-C-1: Would the Project plus cumulative projects result in a cumulatively considerable contribution to cumulative impacts related to visual resources.	Less than Significant	n/a	
Agricultural Resources			
Impact AR-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps for the Farmland Mapping and Monitoring Program by the California Natural Resources Agency, to non-agricultural uses.	Less than Significant	Monitoring Measure AR-1: Pasture Monitoring Plan	Less than Significant
Impact AR-2: Conflict with existing zoning for agricultural use, or a Wiliamson Act contract.	Less than Significant	n/a	
Impact AR-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.	Less than Significant	n/a	
Impact CR-C-1: Cumulative Impacts to Agricultural Resources.	Less than Significant	n/a	
Air Quality			

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact AQ-1: Violate Any Air Quality Standard or Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Project Region is in Non-attainment.	Potentially Significant	Mitigation Measure AQ-1: Dust Control Measures during Construction	Less than Significant
Impact AQ-2: Expose Sensitive Receptors to Substantial Pollutant Concentrations.	Less than Significant	n/a	
Impact AQ-C-1: Project plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Air Quality.	Less than Significant	n/a	
Biological Resources			
Impact BIO-1: Substantial Adverse Effect on Special-Status Wildlife Species	Potentially Significant	Mitigation Measure BIO-1a: Avoidance, Minimization, and Mitigation for Tidewater Goby. Mitigation Measure BIO-1b: Conduct pre-construction Avian Surveys for Nesting Passerine Birds and Avian Species of Special Concern. Mitigation Measure BIO-1c: Avoid, Minimize, and Mitigate for Potential Impacts to Western Snowy Plover. Mitigation Measure BIO-1d: Habitat Enhancement for Northern Red-legged Frog. Mitigation Measure BIO-1e: Mitigate for potential impacts to salmonid species.	Less than Significant
Impact BIO-2: Substantial Adverse Effect on Special-Status Plant Species.	Potentially Significant	Mitigation Measure BIO-2a: Mitigate Impacts to Beach Layia. Mitigation Measure BIO-2b: Mitigate Impacts to Sensitive-Listed Plant Species.	Less than Significant
Impact BIO-3: Substantial Adverse Effect on Sensitive Natural Community.	Potentially Significant	Mitigation Measure BIO-3a: Mitigate Impacts to Sensitive Listed Habitats Through Avoidance and Re-establishment. Mitigation Measure BIO-3b: Mitigate Impacts to Sensitive Listed Habitats Through Control of Invasive Species.	Less than Significant
Impact BIO-4: Substantial Adverse Effect on Federally and/or State Protected Wetlands.	Potentially Significant	Mitigation Measure BIO-4: Mitigate Temporary and Short-term Impacts to Sensitive Habitats Including Wetlands Through Construction Minimization and Avoidance Measures.	Less than Significant

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact BIO-5: Interfere Substantially with Movement of Native Resident or Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Impede Use of Native Wildlife Nursery.	Less than Significant	n/a	
Impact BIO-6: Conflict with Local Policies or Ordinances Protecting Biological Resources.	Less than Significant	n/a	
Cultural Resources			
Impact CR-1: Would the Project cause a substantial change in the significance of a historical or archaeological resource as defined in Section 15064.5.	Potentially Significant	Mitigation Measure CR-1: Disturbance of Undiscovered Cultural Resources.	Less than Significant
Impact CR-2: Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.	Potentially Significant	Mitigation Measure CR-2: Potential Disturbance of Undiscovered Paleontological Resources.	Less than Significant
Impact CR-3: Would the Project disturb any human remains, including those interred outside of formal cemeteries.	Potentially Significant	Mitigation Measure CR-3: Potential to Uncover Human Remains.	Less than Significant
Impact CR-4: Would the Project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074.	No Impact		
Impact CR-C-1: Would the Project result in cumulative impacts to cultural resources.	Less than Significant	n/a	
Geology and Soils			
Impact GEO-1: Expose People or Structures to Potential Substantial Adverse Effects Involving Strong Seismic Ground Shaking or Seismic-related Ground Failure, including Liquefaction.	Potentially Significant	Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.	Less than Significant

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact GEO-2: Result in Substantial Soil Erosion or Loss of Topsoil.	Potentially Significant	Mitigation Measures: HWQ-1a - Manage Construction Storm Water; HWQ-1b - Implement Contractor Training for Protection of Water Quality; HWQ-1c - In-Stream Erosion and Water Quality Control Measures during Channel Excavation and Operations; HWQ-3 - Implement Erosion and Water Quality Monitoring, Maintenance and Adaptive Management Plan; and GEO-1: Implement Recommendations in the Geotechnical Report.	Less than Significant
Impact GEO-3: Be Located on Geologic Unit or Soil that is Unstable, or would become Unstable as a Result of the Project, and Potentially Result in Liquefaction, Lateral Spreading, Subsidence, or Collapse.	Potentially Significant	Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.	Less than Significant
Impact GEO-4: Be Located on Expansive Soil, as Defined in Table 18-1-B of Uniform Building Code (1994), Creating Substantial Risks to Life or Property.	Potentially Significant	Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.	Less than Significant
Impact GEO-C-1: Project Plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Geology and Soils.	No Impact		
Greenhouse Gas Emissions			
Impact GG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.	Less than Significant	n/a	
Impact GG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.	Less than Significant	n/a	
Impact GG-C-1: Result in a cumulatively considerable contribution to a significant cumulative impact relative to greenhouse gas emissions.	No Impact		
Hazards and Hazardous Materials			
Impact HAZ-1: Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HAZ-2: Would the Project 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.	Less than Significant	n/a	
Impact HAZ-C-1: Would the Project, in combination with other cumulative projects, increase exposure of hazardous substances to the public or environment.	Less than Significant	n/a	
Hydrology and Water Quality			
Impact HWQ-1: Violate any Water Quality Standards or Waste Discharge Requirements.	Potentially Significant	Mitigation Measure HWQ-1a: Manage Construction Storm Water. Mitigation Measure HWQ-1b: Implement Contractor Training for Protection of Water Quality. Mitigation Measure HWQ-1c: In-Stream Erosion and Water Quality Control Measures during Channel Excavation and Operations.	Less than Significant
Impact HWQ-2: Substantially Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge.	Less than Significant	n/a	
Impact HWQ-3: Substantially Alter the Existing Drainage Pattern of the Site or Area and Increasing Erosion or Siltation.	Less than Significant	Mitigation Measure HWQ-3: Implement Erosion and Water Quality Monitoring, Maintenance and Adaptive Management Plan.	Less than Significant
Impact HWQ-4: Substantially Alter Existing Drainage Pattern, or Substantially Increase Rate or Amount of Runoff in a Manner which would Result in Flooding On- or Off-site.	Less than Significant	n/a	
Impact HWQ-5: Substantial Additional Sources of Polluted Runoff or Otherwise Substantially Degrade Water Quality.	Less than Significant	Mitigation Measures HWQ-1a through -1c and HWQ-3	Less than Significant
Impact HWQ-6: Place Structures within the 100-year Flood Hazard Area which Impede or Redirect Flood Flows.	Less than Significant	n/a	
Impact HWQ-7: Expose People or Structures to a Significant Risk Due to Flooding.	Less than Significant	n/a	
Impact HWQ-8: Place People or Structures in Areas Inundated by Tsunami.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HWQ-C1: Project Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Hydrology and Water Quality.	Less than Significant	n/a	
Land Use and Planning			
Impact: LU-1: Would the Project 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.	No Impact		
Impact: LU-C-1: Would the Project result in cumulatively considerable contribution to a significant cumulative impact related to land use and planning.	Less than Significant	n/a	
Mineral and Energy Resources			
Impact: ME-1: Would the Project 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, or a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.	Less than Significant	n/a	
Impact: ME-2: Would the Project result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, especially fossil fuels such as coal, natural gas, and oil.	Less than Significant	n/a	
Impact: ME-C-1: Would the Project result in cumulatively considerable contribution to mineral or energy resources impacts.	Less than Significant	n/a	
Noise			
Impact NOI-1: Would the Project result in 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.	Less than Significant	n/a	
Impact NOI-2: Would the Project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact NOI-3: Would the Project result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.	Less than Significant	n/a	
Impact NOI-4: Would the Project result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.	Less than Significant	n/a	
Impact NOI-C-1: Would the Project result in a cumulatively considerable contribution to cumulative impacts from noise.	Less than Significant	n/a	
Public Services and Utilities			
Impact PS-1: Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection and police protection	Less than Significant	n/a	
Impact PS-C-1: Would the Project result in a cumulatively considerable contribution to cumulative impacts related to public services.	Less than Significant	n/a	
Recreation			
Impact REC-1: 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.	Less than Significant	n/a	
Impact REC-2: Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.	Less than Significant	n/a	
Impact REC-C-1: Cumulative Impacts to Recreational Resources.	Less than Significant	n/a	
Transportation			
Impact TR-1: Would the Project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.	Less than Significant	n/a	

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact TR-2: Would the Project substantially increase hazards due to design feature or incompatible use.	Less than Significant	n/a	
Impact TR-3: Would the Project result in inadequate emergency access.	Less than Significant	n/a	
Impact TR-4: Would the Project conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or decrease the performance or safety of such facilities.	Less than Significant	n/a	
Impact TR-C-1: Would the Project result in a cumulatively considerable contribution to cumulative impacts related to transportation.	Less than Significant	n/a	

2. Project Description

2.1 Project Location and Setting

The Project area is approximately 1,850-acres and is located approximately four miles west of the City of Ferndale, in Humboldt County, California (Figure 2-1). Figure 2-2 shows existing components within the Project area. The Project area includes the Eel River Estuary Preserve (EREP) owned by The Wildlands Conservancy (TWC) and various parcels owned by Russ Ranch and Timber, L.L.C (RR&T), and Jack and Linda Russ (Figure 2-3). The Project area includes the following APN's: 10012105, 10013104, 10014201, 10013103, 10012104, 10012101, 10014209, 10014304, 10014303, 10014221, 10101114, 10014308, 10014208, 10014211, 10014302, 10014301, and 10101105.

The west side of the Project area encompasses the near shore dunes of Centerville Beach and extends to the Pacific Ocean. East of the dunes the Project area supports a system of sloughs and pastures that comprise a portion of the Salt River watershed, itself a tributary to the Eel River estuary. The north property line borders the Eel River. The southern half of the Project area includes several perennial tributary streams draining from the Wildcat Hills including: Russ Creek, Shaw Creek, a seasonal drainage referred to as Creamery Ditch, and an unnamed creek that flows off land adjacent to the Project.

Much of the Project area east of and including former Centerville Slough was reclaimed and has been converted to pasture for cattle grazing. Some of this land represents diked former tidelands separated from the estuarine wetlands by a series of dikes and the Cut-Off Slough tidegates. The Project area along with three neighboring landholdings comprise an historic reclamation district that operated with a largely unified vision of managing tidal inundation, as well as the Eel River and Wildcat Hills stream floodwaters.[1]

A partially developed upland area occupies the eastern portion of the Project area, where vehicular access is gained from Russ Lane. Few structures occur on site, but there are two residences: one at the southwestern edge of the Project and another at the eastern edge; two barns within the upland area near Russ Lane (referred to as the Potato Barn and Quonset Hut); a third barn (North Barn) located between Cut-Off Slough and the near shore dunes, approximately midway between the north and south property lines of the EREP; and a fourth barn (South Barn) located in the southwest corner of the EREP. The North and South barns are connected by unimproved roads to the Potato Barn at the Project area entrance. The Potato Barn includes a ranch office, and storage for agricultural equipment. Watering troughs and extensive fencing occur throughout the central and southern portion of the Project area.

EREP includes agricultural (grazing) land, tidal salt marsh, brackish marsh, riparian scrub, sloughs/open water channels, freshwater ponds and ditches, and nearshore dune ridges and swales. Russ Ranch and Timber, LLC, and Jack and Linda Russ, own the parcels immediately south of EREP; this area includes grazing land with managed ditches, open water channels and mixed freshwater and brackish marsh.

[1]This delicate balancing of conflicting forces was achieved by storing floodwaters from the Wildcat Hills to the south behind a system of levees and tidegates, and then draining that stored water northward (primarily through the Cut-Off Slough tidegate) when low tide conditions in the Eel River estuary permitted. The proposed Project adheres to this approach. Therefore, ensuring that the proposed Project does not diminish the flood storage capacity within the system of dikes is a fundamental design criterion for the Project.

The climate is Mediterranean with precipitation most abundant in the winter months. The average annual rainfall is approximately 48.5 inches. Approximately two thirds of the year, the area is influenced by coastal fog. Prominent water features within the Project area include Russ Creek, remnant Centerville Slough, Cut-Off Slough, and the Western Drainage Ditch (which in turn conveys the flow of Shaw Creek and Creamery Ditch), as well as smaller (seasonal) slough channels and drainage ditches. The northern end of the Project area borders the mouth of the Eel River. The Project area ranges in elevation from below sea level to an approximate elevation of 30 feet. Unless noted otherwise, all elevations presented in this Project description are referenced to North American Vertical Datum 1988 (NAVD-88).

Humboldt County General Plan Land Use designation for the Project area is Agriculture Exclusive (AE). Primary uses in AE designated lands include the production of food, fiber, plants, timber, timber agriculturally related uses, and agriculture related recreational uses. Zoning for the Project area is AE-60/W, F, R, T, which means parcel sizes with a minimum of 60 acres and combining zones of coastal wetlands, flood hazard areas, streams and riparian corridor protection, and transitional agricultural lands.

The Project area is enrolled in Williamson Act contracts. The EREP portion of the Project is enrolled in a Williamson Act contract entitled “Wildlands Conservancy Agricultural Preserve No. 09-05.” Approximately 648 acres are identified in that contract as being “Areas In Grazing.” The contract includes several parcels (APN’s 100-121-01, 100-121-03, 100-121-04, 100-121-05, 100-131-03, 100-131-04, 100-142-01). The parcels south of the EREP are also enrolled in a Williamson Act contract entitled “Centerville Ranch Agricultural Preserve No. 87-28”, originally recorded on February 27, 1987, and amended in 2008. It originally included eight parcels, filed under APN 100-142-010. A lot line adjustment was completed in 2008 and 45 acres were added to the contract. APN 100-142-010 was part of the lot line adjustment, and part of the lands added to the contract. After completion of the lot line adjustment, a new APN (100-142-021) was created for the newly adjusted 100-142-010. Parcels now included in that contract are APNs 100-142-008, 100-142-009, 100-142-011,100-142-021, 100-143-002, 100-143-003, 100-143-004, 101-011-005 and 101-011-014. The contract does not specify which portions of the property under contract are “Areas In Grazing.”

In addition, The Natural Resources Conservation Service (NRCS) is crafting two Wetland Reserve Easements (WRE) in conjunction with both RR&T (APN 100-143-008) and TWC (APN 100-121-004). The former is expected to be completed in 2016 and the latter in 2017.

A formal drainage easement burdening the EREP with TWC and the Bertha Russ Lytel Foundation (now O’Rourke Foundation, or “ORF”) as grantors also influences land management options in the Project area. Within the Project area, a complex system of dikes, tidegates and drainage ditches enable multiple land managers to operate successful agricultural operations on what was historically tidal marsh. Since the area generally declines in elevation as one moves from south to north, drainage moves roughly northward across numerous properties. The mutual inter-dependence of landowners in the Project area upon this infrastructure is formally expressed in a drainage easement. The drainage easement was recorded October 20, 2008, shortly after the purchase of the Connick Ranch by TWC. In general, this easement allows the grantees (various Russ property owners, collectively “Russ”) to enter and perform certain drainage maintenance functions on the EREP and ORF property, to the extent that these are legally permissible. Key actions include removal of sand and sediment from the Western Drainage Ditch when it becomes clogged, and maintenance of the Cut-Off Slough tidegate and perimeter dike in order to facilitate drainage when conditions in the Eel River estuary permit and as environmental regulations allow.

The easement is restrictive and dictates maintenance conditions for a hydraulic system that is overwhelmed by the dynamic nature of the Project area, located as it is at the mouth of California's third largest river system. Sand and silt may be removed from the Western Drainage Ditch from time to time based on wave over-wash or avulsion events, respectively, but sand must be placed to the west of the easement, and silt to the east. Grantees are not allowed to increase the width of the 5-10 foot wide ditch (once historic Centerville Slough) through the course of these maintenance activities. In effect, the easement preserves the ability to exercise a minimal level of emergency maintenance.

2.2 Project Goals and Objectives

The goal of the Project is to improve geomorphic and ecosystem functions that would enhance habitat for native fisheries and aquatic species, support waterfowl and wildlife species, and benefit agricultural land management by more effectively managing onsite flooding and sedimentation.

Project objectives also include designing and planning for future climate scenarios and sea level rise in relation to agricultural land management, capacity and uses, dune enhancement, and vegetative communities. Specific objectives of the Project include:

- Improve access to restored aquatic habitats for salmonids and other aquatic dependent species by increasing or creating migratory access between estuarine and inland waters and by restoring overwintering and rearing habitat for juvenile salmonids
- Improve drainage efficiency and manage sediment loads more effectively using both passive natural processes and active management approaches, while enhancing tidal influences by re-establishing connectivity of Russ Creek, Shaw Creek and Creamery Ditch to a rehabilitated Centerville Slough
- Increasing resiliency to sea level rise and reducing salt water influences to pastures, enhancing drainage and establishing avulsion management areas for Russ Creek and Shaw Creek
- Enhance tidal processes by restoring tidal prism and improve reliability of tidegate infrastructure to provide adaptability for sea level rise and varied land management
- Enhance dune formation to increase resiliency to sea level rise
- Enhance freshwater pond habitat for waterbirds and other native aquatic dependent species
- Facilitate access for continued passive and active agricultural land management, and nature study opportunities consistent with existing conditions
- Suppress invasive species
- Establish long-term Adaptive Management Program.

2.3 Project Overview

The proposed activities would enhance the Project area by transitioning it from a landscape of mostly diked pasture land to a system of pastures and natural habitats including estuarine and tidal slough channels, freshwater streams, freshwater waterfowl ponds, and agricultural pastures. Critical to achieving this are: an enhancement in tidal exchange to reactivate wetland functions within the Inner Marsh and Centerville Slough; establishment of active sediment management areas; dune enhancement; and the creation of setback berms.

New muted-tidegates would be designed and installed in existing levees to re-introduce tidal prism into the Inner Marsh and Centerville Slough, enabling tidewaters to re-occupy historic tidal slough channels that have persisted despite former reclamation efforts, floods and significant tectonic activity. This would enhance aquatic organism passage from the Eel River to Centerville Slough, Shaw Creek and Russ Creek, while improving drainage efficiency. Additionally, repairing the existing tidegate structure on Cut-Off Slough through modification of the existing gates would increase infrastructural reliability and drainage efficiency, and provide an opportunity to restore fish passage into Cut-Off Slough.

Realignment and geomorphic restoration of Centerville Slough, Russ Creek and Shaw Creek is expected to support the introduction of overwintering juvenile salmonids, waterbird habitat and drainage from the landscape, and maintain an existing drainage easement. Improved drainage and habitat conditions would be established along Russ Creek.

It is acknowledged that the formal establishment of sediment management areas presumes future passive and active management, maintenance and long-term commitment to land management goals. This is particularly true in the absence of full historic tidal and floodplain functions, which historically maintained the area in equilibrium. Just as it was necessary and actively pursued prior to the development of the proposed Project, so, too, would such work be necessary in the future. The key difference is that the work would be geographically prescribed, permitted, and, presumably, more predictable and cost effective and consistent with long-term goals of naturally elevating low lying floodplain areas in advance of sea level rise. This effort is necessary to maintain agricultural viability, agricultural land management, capacity and uses, and ecological function. Similarly, management of the flattened (breached) dune regions would include actions to protect an existing drainage ditch and agricultural resources, agricultural land management, capacity and uses, while furthering science and projects relating to passive and active dune enhancement and climate change vulnerability. As a retreat strategy to reduce agricultural land vulnerability from sea level rise, the proposed placement of set-back berms would provide increased resiliency.

The longevity of Project benefits depends upon the successful restoration of some natural ecological processes and the frequency and nature of maintenance activities. As a result, this Project would include an Adaptive Management Plan (AMP) to provide a feedback mechanism for management responses based on scientific monitoring. Figure 2-4 illustrates the proposed Project components and Figure 2-5 provides typical Project cross sections.

2.4 Proposed Project Components

The primary Project components are discussed below.

2.4.1 Retrofit Existing Cut-Off Slough Tidegates

The existing tidal control structure in Cut-Off Slough provides the only anthropogenic conduit of drainage from the Project area into the Eel River. The structure is equipped with six top-hinge tidegates that leak and limit aquatic organism passage to/from the Eel River. The existing tidal control structure in Cut-Off Slough is a tidegate structure first built in the late 1800's and replaced in 1979. The accompanying dikes are approximately two miles in length and include the aforementioned tidegate. This system protects an estimated 2,000 acres of productive agricultural lands. The system was built and has been maintained collectively primarily by the following entities or individuals: 1) Fern Cottage, Inc., 2) Russ Ranch and Timber Co., LLC, 3) The L.D. O'Rourke Foundation, 4) L and K Russ; 5) Connick Ranch, and; 6) The Wildlands Conservancy. An existing drainage easement, described above, provides surrounding landowners with a right of access over

the EREP for the purposes of maintaining drainage for the EREP and surrounding properties, to the extent allowed by law. The Project will necessitate the concurrent development of a Water Level Management Plan (WLMP) by all owners of the drainage and tidegate structure and may result in the revision of the current drainage easement. The WLMP is further described in the AMP section of this Project description.

During summer months, the average water surface elevation on the landward side of the tidegates is approximately 2.5 feet (NAVD-88) and sustained by groundwater influences, occasional dune over-wash, and tidegate leakage. During winter months periods of prolonged inundation and flooding occur upstream of the tidegate as the backwater influence from the Eel River estuary prevents the gates from opening during low tide cycles and for extended periods of time. The salt tolerant vegetative communities that have established along the banks of Cut-Off Slough upstream of the tidegate structure corroborate the brackish conditions. Overland drainage from adjoining properties is collected in Western Drainage Ditch and Cut-Off Slough and ultimately drains through the existing Cut-Off Slough tidegates.

Three iterations of the Cut-Off Slough tidegate have blocked tidal exchange into the Project area and facilitated overland drainage from the Project area since the late nineteenth century. The existing concrete Cut-Off Slough tidegate structure was constructed in 1978 on the landward side of the existing earthen dike immediately west of the former tidegate structure. The construction included excavating new connector sloughs, re-contouring the existing dike with the spoil material and demolishing/burying the former tidegate built circa 1916, which in turn replaced a structure built in the 1870s. Based on review of the current tidegate construction plans and current visual observations during low tides, the exterior wall upon which the gates are attached appears in good condition with no apparent distress or visual cracking, apart from the seaward side wingwalls, which are cracked, with a major crack on the western wall. The wingwall crack has no impact on the proposed gate modifications and continued failure of the wall does not impose a threat to the overall structure, though it could result in localized dike erosion. The wood gates appeared degraded and leakage between the weathered concrete and wood is apparent through each of the six gates.

Proposed Work – EREP

The Cut-Off Slough tidegate structure would be repaired to serve its original purpose with modified gates that would improve fish passage without significantly altering water quality and water level relative to existing conditions. The Project does not propose to increase capacity at this structure, however proposed repairs there will likely improve gate efficiency. The Project proposes to improve aquatic passage, and not adversely impact existing hydraulic conditions upstream. Repaired tidegates and/or fish passage doors inserted into the existing structure would allow for improved, but managed, tidal function and improved drainage efficiency in Cut-Off Slough and adjoining properties, while also providing fish passage and complying with state and federal law.

The repaired or replaced gates would be steel or aluminum, side- and/or top hinged designed to meet specific hydraulic performance and installed by a gate manufacturer to the existing concrete wall with a new thimble seal. To reduce costs and minimize abrupt hydraulic changes gates may be installed or replaced individually. These changes would be reflected in the WLMP.

Proposed Work – Russ Property

No work is proposed on Russ Property for this component.

2.4.2 Expand Seasonal Tidal Prism to Inner Marsh and Re-established Centerville Slough through the installation of New Muted Tidegates

Referred to as the Inner Marsh, this 150-acre area is surrounded on its northern, eastern, and southern boundaries by a dike of varying elevations. Natural dunes form the western boundary. The area is hydraulically connected with culverts to Centerville Slough and Cut-Off Slough on the landward side of the Cut-Off Slough tidegate. The perimeter dike provides a setting for expanding tidal wetland habitat without threatening adjacent land uses. To achieve this, tidal access would be modified to reintroduce tidal exchange at a muted level.

Proposed Work – EREP

To increase and improve tidal wetland and salmonid rearing habitat, tidal exchange would be reintroduced to the Inner Marsh and re-established Centerville Slough. A new tidegate structure connecting the Inner Marsh to Cutoff Slough would be installed through the existing dike immediately west (outboard) and separate from the existing Cut-Off Slough tidegate structure. This new tidegate will likely have multiple gates including a muted tidegate regulator (MTR). Strategic design and sizing of these new tidegates would restrict tidal exchange to the Inner Marsh such that tidally-controlled water levels would not rise above 2.5 feet in elevation during the winter months and 5 feet during the summer months. The new tidegate structure would be approximately 75 feet long by 100 feet wide and 20 feet tall. The WLMP would include specific tidegate settings and seasonal operation guidelines to meet the desired hydraulic conditions for the area. The existing interior Inner Marsh dike would be raised to a minimum 8.0 foot elevation, widened in discrete areas and resurfaced with gravel to improve access reliability for operation and maintenance needs. Existing failed culverts that connect the Inner Marsh to Cut-Off Slough would be removed and the dike repaired in these locations. Additionally, a re-established Centerville Slough would be realigned into the Inner Marsh to prevent tidal flooding into Cut-Off Slough and adjoining properties.

A significant constraint associated with introduction of the muted tide above the existing groundwater surface elevation of 2.5 feet to the Inner Marsh and re-established Centerville Slough is the loss of flood storage capacity of the surrounding and interconnected Project area. Avoiding diminished storage capacity is a design constraint for the Project. Any reduction of flood storage above an elevation of 2.5 feet would be ameliorated through excavation of an equivalent or greater volume of sediment above 2.5 foot elevation in the re-established Centerville Slough and implementing a seasonal operation regime for the MTR. The seasonal operation approach would involve managing tidal exchange differently based primarily on precipitation patterns. During the summer dry season, when management of floodwaters is irrelevant, the MTR would allow for a tidal amplitude up to 5.0 foot elevation. During the winter wet season, and in advance of anticipated storm events, the MTR would be adjusted to reduce tidal inflow to a maximum of 2.5 foot elevation. This reduction in tidal inflow would retain the Inner Marsh and re-established Centerville Slough capacity to provide freshwater storage from Russ Creek runoff similar to how it now functions. The combined balance of the excavation volume and/or seasonal operation flexibility is intended to result in no net loss of available freshwater runoff storage volume during winter months relative to existing conditions, while also improving the overall hydraulic function and drainage within the Project area. A water elevation versus available storage volume graph for pre- and post-Project is presented in Chapter 3.

The MTR would be seasonally operated based on biologic, geomorphic, hydrologic and land use objectives with routine monitoring to inform operational scenarios. Chapter 3 provides a discussion on the hydrology of the Project and an analysis of a broader range of tidal elevation options in addition to those recommended for the proposed Project. A WLMP that explains floodwater

management strategies, and details the proposed operations of the proposed infrastructure, will be developed concurrent with development of the EIR.

Existing culverts connecting the Inner Marsh with Cut-Off Slough and Centerville Slough would be retrofitted with flap gates to allow one-way flow into the Inner Marsh, equipped with seasonally operated gates, or be removed and any remaining holes within the berm would be repaired. This would maintain the existing level of variation in tide flow elevations between the Inner Marsh and Cut-Off Slough.

The existing network of sloughs and terminal ponds within the Inner Marsh would provide sub- and inter-tidal habitats. A number of new small terminal ponds, earthen weirs, side channels and wood structures would be integrated into the final design to improve upon and diversify the existing channel network complexity providing low energy perennial ponding areas that emulate desirable habitat structure for the tidewater goby and juvenile salmonids. The majority of the internal slough channels will be constructed to provide adequate water depths and conditions for expansion by native eelgrass, which currently occurs in low abundance in existing channels.

Proposed Work – Russ Property

While no physical work is proposed for this component on Russ Property, the installation of the MTR would allow the expanded tidal prism to extend to Angels Camp through the re-established Centerville Slough, which is further described below.

2.4.3 Re-establish and Enhance Centerville Slough and ReconnectRuss and Shaw Creek with the Estuary

Historically, Centerville Slough extended from its confluence with the Salt River, through present day O'Rourke Foundation property, south from Cut-Off Slough, parallel to the dune network all the way to the community of Centerville at the base of the Wildcat Hills. Tidegate installation and the associated reduction in the tidal prism, coupled with reclamation and actively directed Russ Creek avulsions, infilled much of this historically navigable slough. The Western Drainage Ditch and Cut-Off Slough are all that remains as remnant drainage features. The Western Drainage Ditch lies in the path of disturbed dunes and is vulnerable to continued dune over-wash and sedimentation. Western Drainage Ditch collects dune over-wash, Creamery Ditch flow, Shaw Creek flow, and unnamed creek flow originating from the Halley property. Russ Creek once flowed into the Centerville Slough system, and was then directed to Western Drainage Ditch, but now terminates with avulsion and overland sheet flows over existing pastures on the EREP.

Proposed Work – EREP

Re-establish Centerville Slough and Restore Connectivity to Russ and Shaw Creeks

In order to increase aquatic habitat and enhance the movement of water and fish/wildlife to the north and south, the Project proposes to re-establish Centerville Slough by excavating a channel along its historic alignment. The south end of the proposed Centerville Slough alignment would reconnect to Shaw Creek in the existing Angels Camp area. The northern end would be re-aligned into the Inner Marsh immediately upstream of the existing bridge crossing and become disconnected from Cut-Off Slough. The connectivity with the Inner Marsh would allow for an increase in summer tidal amplitude within Centerville Slough without impacting the neighboring ORF property whose levees have deteriorated to fairly low elevations. A new water control structure and/or earthen berm at or near the existing bridge would prevent high tides during the dry season regime from entering Cut-Off Slough downstream of the existing bridge; however, during high winter flows from Russ Creek during the winter months, the water control structure or berm

would allow overland freshwater flow to be conveyed downstream of the existing bridge occupying available storage in Cut-Off Slough and on adjoining properties similar to existing conditions.

Approximately 3,000 feet of Western Drainage Ditch, from the southern dune breech northward, would remain as a remnant side channel to the re-established Centerville Slough. It would then be reconnected to Centerville Slough on the northern end in an area that would be enhanced for ecological benefit and drainage efficiency. The reestablishment of Centerville Slough would reconnect Russ Creek and, provide conveyance for over-wash on properties to the south. In general, the Centerville Slough channel would be sized to enable the slough to serve as, conveyance, and brackish aquatic habitat sharing similar tidal amplitudes as the Inner Marsh.

Because Centerville Slough was located further east than the existing Western Drainage Ditch, it would be less susceptible to filling from dune over-wash sand. Material excavated from Centerville Slough would be reused on site to construct any new or refurbished berms or reused in within the Project area. The new slough channel would convey muted tides from the Inner Marsh as well as be the primary water course receiving and conveying runoff from Russ Creek, Shaw Creek and the Creamery Ditch. It would also improve the opportunity for fish passage to the tributary creeks.

Reconnection of Russ Creek to Centerville Slough

A new channel would be graded that follows an historic Russ Creek alignment to re-establish connectivity with Centerville Slough. This excavation above the 2.5 foot elevation would improve site drainage, create in-channel flood storage, re-establish a long tidal to freshwater ecotone and provide a wetland prism that includes freshwater wetland and/or riparian habitat. In addition, the improved Russ Creek channel would provide habitat connectivity for anadromous fish.

Develop Primary Sediment Management Area on Russ Creek

To accommodate natural flood processes, sediment management areas would be established in avulsion prone regions along Russ Creek. Sediment deposits on the EREP would remain or be seasonally relocated within sediment management areas and approved Project locations as needed. The sediment management area would then be seeded and irrigated as needed to enhance agricultural productivity in those areas.

Proposed Work – Russ Property

Reconnection of Shaw Creek to Centerville Slough

The Project would realign Shaw Creek to re-establish connectivity with Centerville Slough. This would provide approximately 1.1 miles of freshwater-brackish water ecotone, which would improve site drainage, create in-channel flood storage and provide habitat connectivity for anadromous fish.

Develop Primary Sediment Management Area on Shaw Creek

Similar to Russ Creek, natural flood processes would be leveraged to establish sediment management areas in avulsion prone areas on Shaw Creek. Sediment naturally deposited, mechanically placed and or excavated on the lands of Russ Ranch and Timber Company, LLC and Jack and Linda Russ would be tilled, seeded, fertilized and irrigated to re-establish or enhance livestock forage and grazing areas.

Develop Secondary Sediment Management Area and Floodplain Swales

Given the highly dynamic nature of Russ Creek and the limited capacity of primary sediment management areas, secondary sediment management areas would be designated on the Russ Ranch and Timber, LLC property. Floodplain swales or drainage facilities would allow release of over-bank flows to be directed to the secondary sediment management area from Russ Creek. Flow and sediment would be directed to low lying areas thereby reducing flood frequency of nearby

properties. These areas would function and be managed very similar to primary sediment management areas.

All excess sediment to be managed on site would be spread across designated sediment management areas existing agricultural areas at an agronomic rate that would sustain soil quality and increase the elevation of grasses thereby sustaining forage production of freshwater grasses in agricultural areas.

2.4.4 Enhance Existing and Create New Off-Channel Aquatic Habitat

The lack of tidal connectivity across the Project area has led to infilling and reduced availability of brackish and freshwater ponds for waterfowl and overwintering fish habitat. The existing freshwater ponds that are present on site have a long tradition of waterfowl hunting.

Proposed Work – EREP

The lack of hydraulic connectivity across the EREP has led to infilling and reduced availability of brackish and freshwater ponds for waterfowl and overwintering fish habitat.

Salmonid Habitat

The introduction of muted tidal exchange introduces the opportunity to recreate historic on- and off-channel ponds and the associated wetland habitats within the historic back-dune Centerville Slough channel system. Due to the relatively low amplitudes of restored tidal action, recreating brackish marsh will necessitate lowering (excavating) down into the proposed muted tidal range. Brackish marsh/ponds will likely be sighted in relatively low, off-channel lying areas and connected to create Project slough channels by excavation of relatively small connector channels. New brackish water ponds for overwintering juvenile salmonids would also be created by deepening other existing depressions in the floodplain of Centerville Slough/Russ Creek. Alcoves, terminal ponds and large wood structures would be established to provide additional habitat benefit.

Waterbird Ponds

Existing depressions in the landscape currently serve as freshwater ponds that are managed for waterfowl. These existing freshwater ponds would be deepened and re-configured with controlled inlets/outlets to enhance their habitat value and minimize long term maintenance. Seasonal rainfall would be the primary means of filling the ponds, while existing wellheads would provide backup supply.

New gated culverts and/or earthen berms would be constructed to allow water in the ponds to drain into Centerville Slough and the unnamed remnant slough to the east of the property. Expansion of the ponds and rehabilitation of the source wells are not proposed.

Proposed Work – Russ Property

No work is proposed on Russ Property for this component.

2.4.5 Protect and Enhance Drainage, Land Uses, and Habitats

Threats to existing habitat and land uses include disturbances of coastal dunes, saltwater intrusion, loss of estuary-inland water connectivity, sedimentation of watercourses, subsidence and natural conversion of agricultural pasture, and invasive species.

Sea level rise alters groundwater composition and vegetation communities. As soils become increasingly saline and brackish, salt marsh vegetation would dominate. Periodic dune breaches exacerbate this effect. This is already being observed widely across the Project area, and particularly within the historic alignment of Centerville Slough. While some areas within the Project

area are targeted for tidal wetland increases, other areas would be preserved for agricultural pasture.

Natural sand dunes are generally self-maintaining; however, their form and dynamics are influenced by vegetation, sediment recruitment, storm/wave strength, geologic changes and other factors. Non-native invasive vegetation such as Ammophila arenaria (European beachgrass) alters dune mobility and shape. Both natural and anthropogenic influences can disturb dune formation. Dunes traditionally migrate, and possess various zones of recruitment that tend to protect the leeward side of the dune system. More recently, significant disturbance has occurred at three distinct locations within the Project area: a northern area of approximately 15 acres located on EREP, a central area of approximately 3 acres on EREP, and a southern area of approximately 40 acres on Russ property. The disturbance and movement of this sand unconfined in any remaining dune network threatens the Western Drainage Ditch with infilling, a trend that threatens the safety and land use of the Project area and properties to the south, all of whom are parties to a formal drainage easement over the Project area. This movement has also facilitated breach and wave over-wash events that have inundated hundreds of acres of pasture with salt water, impacting their agricultural utility and causing conversion to salt marsh.

Re-establish Dune Configuration

This Project seeks to implement passive and active techniques in dune management aimed at increasing resiliency to sea level rise while minimizing impacts to known habitat of the Western Snowy Plover. The bulk of Project effort associated with dune enhancement would be directed towards three over-wash sites, referred to as the northern, central and southern sites and as depicted on Figure 2-4. Specific actions that would be taken at the over-wash sites are described below, and potentially elsewhere in the dune network, and were drawn from the *Eel River Coastal Plain Dunes Assessment and Restoration Feasibility Analysis* report (Appendix C) developed by Kamman Hydrology and Engineering (KHEb 2015). In addition to the actions proposed below at each site, restriction of off-road vehicles through signage and fencing of the immediate enhancement area and implementation of a long-term monitoring and management program will be necessary. Over time, natural wave processes and storm actions may re-shape any alterations made. Further storm events would cause scarping, potentially further inland from the mean high water mark due to the absence of stabilizing vegetation. Therefore, the Adaptive Management Plan would include performance measures and actions that track changes with time and take suggest corrective action to prevent reversal to the original situation.

Proposed Work – EREP

The proposed work at the northern and central sites would combine discrete enhancement actions with distinct actions intended to limit land use impacts and would promote trapping and retaining sand in a manner that rebuilds the dune in over-wash areas to former and surrounding heights. This combined effort would enable the dunes in their existing location to rebuild and fortify over time. In addition, the integrity of the dunefield west of the EREP would gradually reconfigure to near-historic breadth and height through these actions taken in the Project. Relinquishing the need for drainage conveyance in the Western Drainage Ditch allows for dune migration inland as part of its recovery process without conflicting with existing agricultural uses.

Proposed actions at the northern and central sites include, but are not limited to:

- Mechanical Dune Construction - The proposed Project design would include a pilot project to mechanically elevate and reconstruct dunes that have been lost to over-wash events. Sand skimmed from the over-wash areas and adjoining areas would be used to construct new

dunes to similar heights and widths of adjoining dunes and over a total area of approximately 8 acres.

- Sand Fence Installation - Sand fence would be installed in combination with the constructed dunes, or areas prone to over-wash, in order to promote the recruitment of sand for dune rebuilding purposes.
- Large Wood (Wrack) Placement - Recognizing that natural recruitment of large wood assists in the recruitment of sand on dunes, the final designs may include large wood placed at select locations in wave over-wash areas to promote dune rebuilding.
- Planting Native Vegetation - Native plants capable of encouraging dune stability would be planted as part of a revegetation strategy.
- Accommodating Natural Dune Building Processes - The design and configuration of Project features would ensure the ability of dunes to migrate eastward, thereby facilitating the reestablishment of zones of recruitment in the dune network capable of protecting the dune system from episodic disturbance.
- Beach Nourishment – Research and develop a strategy for long-term beach nourishment at the Project site.

The proposed actions described above at the northern and central sites are intended to convert the over-wash areas back to dunes thereby directly impacting known Western Snowy Plover habitat. To offset the loss of this habitat, the Project proposes to create similar habitat by removal of non-native beach grass on the dune strand west of the Outer Salt Marsh. Up to approximately 10 acres of non-native beach grass will be removed from this area using a combination of mechanical, hand removal, burning and/or herbicide methods.

Proposed Work – Russ Property

Proposed actions at the southern site include a combination of mechanical dune construction, sand fence and revegetation (as described above). However, actions are limited to the eastern-most fringe of the over-wash (approximately 3-acre footprint) to avoid direct and indirect impacts to the broader over-wash area, which serves as Western Snowy Plover habitat.

Invasive Species Removal

Invasive dense-flowered cordgrass (*Spartina densiflora*) has infested an estimated 90% of salt marshes in Humboldt Bay and the adjacent Eel and Mad River estuaries. Cordgrass is most abundant at low to mid-marsh elevations, where it has displaced native pickleweed (USFWS 2015). The Outer Marsh north of the Inner Marsh is dominated by invasive *Spartina* as is much of the northern Eel River estuary. Discrete isolated patches of Spartina exist within Centerville Slough and Cut-Off Slough. The *Humboldt Bay Regional Spartina Eradication Plan (Regional Plan)* and corresponding *Programmatic Environmental Impact Report (PEIR)* describe a programmatic approach for eradicating invasive cordgrass at a regional scale (HTH 2012). The proposed Project does not include activities within the Outer Marsh and therefore removal of *Spartina* in this area will be subject to available funding and implemented over-time in accordance to the Regional Plan. *Spartina* located south of the Outer Marsh and within the footprint of the proposed Project components will be treated prior to or during construction using various strategies including but not limited to top mowing, grinding and/or excavation and burial. Spartina located on the edges of Centerville and Cut-Off Sloughs adjoining ORF property will be removed on a site-by-site basis in coordination with the ORF. This area is less than one acre in size. To reduce colonization of *Spartina* into the newly created tidal wetlands, *Spartina* monitoring and management post-

construction would be discussed within the Adaptive Management Plan and Mitigation Measure BIO-3b in the Biological Resources section. Management treatments similar to those proposed within the Project footprint (mowing, grinding and/or excavation) will be proposed long-term.

European Beachgrass (Ammophila arenaria) is also present within the Project boundary. Limited Ammophila removal would also occur as part of dune reconfiguration areas and revegetation efforts; however, this is not a specific objective of this Project. Localized areas of limited Ammophila removal may occur on the dune strand north of the Inner Marsh with the intent to diversify dune function and promote Snowy Plover habitat.

The Project would provide the basis for ongoing invasive species management and eradication using passive and active restoration techniques, and participating when appropriate with local and regional programs.

Protect Agricultural Pasture through Berm and Infrastructure Construction – EREP Property

Existing set-back berms would be enhanced and new berms would be constructed to improve overland drainage efficiency and increase resiliency of agricultural land from wave over-wash and rising sea levels. The berms would be constructed of excavated soils with gradual side slopes to allow for grazing on the east slope, and a transitional wetland-upland ecotone on the west slope.

A new guide berm would be constructed to the east of Russ Creek at an approximate 8.0 foot elevation. The existing access roads and berms along the EREP property's eastern and southern boundaries would be improved by raising and resurfacing.

Three new one-way culverts would be installed in the northern berms to allow drainage of the freshwater off-channel habitat to the Inner Marsh from Cut-Off Slough. The existing bridge across Cut-Off Slough would be modified to include a new gated culvert, which would enable hydraulic equilibration between Cut-Off Slough and the Project area during the wet season.

In order to retain land management and agricultural utility of the entire Project area on EREP, two new bridges are proposed within the EREP property. One is located over the re-established Centerville Slough channel at the southern end of the Inner Marsh and the second is across Centerville Slough, northeast of the South Barn. Based on existing channel alignments and size, the bridges would have a maximum length of approximately 75-feet.

Protect Agricultural Pasture through Berm Construction – Russ Property

The existing guide berm along Creamery Ditch would be improved along with other existing set-back berms. A new berm would be constructed along Shaw Creek to restrict overland drainage and increase resiliency of agricultural land from wave over-wash. The berms would be constructed of excavated soils with gradual side slopes as previously described. Berms would be constructed to minimum 8.0 foot elevation to protect prime agricultural land from tidal influence and rising sea levels. A new gated culvert would be installed through the berm to provide conveyance of Creamery Ditch into Centerville Slough while preventing tidal exchange into adjoining agricultural land.

2.4.6 Public Education and Access

Russ properties are managed exclusively for agricultural production. TWC property is managed for agricultural production and for outdoor recreation and education opportunities. The EREP hosts an historic private duck hunting club, welcomes invited guests and docent-led group site visits, and uses the site to educate school children about wetland and estuary systems and agriculture as practiced in the Coastal Zone. There is an ongoing dispute between TWC and the Russ family

regarding the existing easement to the EREP and whether it allows public access. This is discussed at length in the Recreation chapter.

Proposed Work – EREP

Main Barn and Parking Area

Minor improvements to the Parking Area and signage limiting visitors to existing trails would educate any visitors to the EREP about the prevailing agricultural land use in the area, limitations on recreational opportunities, and seasonally or topically oriented restrictions. Signs about the cultural, agricultural and natural heritage of the area would interpret the landscape for viewers. A vault toilet would be installed to reduce impacts to the landscape.

North Barn Parking Area

Minor improvements to the North Barn Parking Area and signage limiting visitors to existing trails would facilitate TWC's outreach and education efforts while minimizing impacts to the Project area. Signs about the cultural, agricultural and natural heritage of the area would interpret the landscape for viewers. A vault toilet would be installed to reduce impacts and traffic back to the entrance for use of the Main Barn vault toilet. The parking area would be limited to the existing heavy-use agricultural area.

Dune Walk and Overlook

A short boardwalk and trail with an overlook would take visitors along an existing trail, near the North Barn, into an intact dunefield for birding and natural observation.

Kayak Put In and Take Out

Two kayak 'put in and take outs' would be installed around the Inner Marsh. One is proposed to be located near the proposed bridge over re-established Centerville Slough and the second at the new muted tidegate west of the Cut-Off Slough tidegate and to the north of the Inner Marsh. The put in and take outs will consist of foot accessible ramps with all-weather gravel surfaces. Kayak access to the Inner Marsh would facilitate post-Project monitoring of the Inner Marsh, aquatic educational programs, and minor recreational use by visitors. Interpretative signage would be installed at each put in and take out informing visitors of appropriate kayaking locations and tidal conditions.

Road and Pasture Improvements

Several appurtenant structures are proposed, such as new gates on Russ Lane, an entrance sign and suitable lighting that clearly denotes EREP hours of operation, as well as additional area and/or perimeter fencing to provide adequate turn-arounds and protection for livestock. Project implementation and future management would require durable yet limited access routes that minimize impacts to the Project area. Some existing access routes, culverts and bridges would be improved and maintained, while others may be decommissioned. Routes would be designed to accommodate a range of vehicle types and weight classes and culverts replaced as needed to increase access reliability for agricultural and Project operations.

Proposed Work – Russ Property

Russ properties are managed exclusively for agricultural production. No public education or access is proposed on the Russ properties.

2.4.7 Beneficial Reuse of Excavated Sediments During Construction

Table 2-1 contains the primary earthwork volumes (cuts and fills) associated with the Project. The Project would generate significant quantities of excavated soils. The Project would attempt to balance the cuts/fills on-site through various beneficial reuses. Proposed onsite reuses include

berm construction, agricultural upland application and rehabilitation of existing berms and roads on EREP, Russ and/or O'Rourke Foundation property and tidal hummocks to diversify tidal marsh elevations. Other off-site beneficial reuses may exist such as White Slough Wetland Enhancement Project and Salt River Ecosystem Restoration Project; however, these are not analyzed in this EIR because the Project is not expected to generate a surplus of soil that requires off-site placement.

The majority of the sediments tested are comprised of silty fine sands, sandy silts and clay, and are suitable for proposed construction activities. Laboratory analytical results indicate that soils within the Centerville Slough excavation have relatively high electrical conductivity (EC), exchangeable sodium percentage (ESP) and sodium adsorption ratio (SAR) values, indicating that they are saline-sodic. In general, the salinity of the soil increases with depth. Reuse of saline-sodic soils for agricultural purposes is not recommended due to the potential for soluble salts within the excavated material to leach into the soil and impede vegetative growth. Graded areas requiring immediate establishment of non-salt marsh vegetation would be capped with either low- or non-saline-sodic soils derived from the surficial soils within the Project area. Based on the final design, a decision would be made on the potential for sediment reuse for beneficial reuses.

Table 2-1 Approximate Project Earthwork Volumes

Description	Cut (CY)	Fill (CY)
Centerville Slough and Shaw Creek	130,000	
Russ Creek and Floodplain Swales	20,000	
Russ Creek Sediment Management Area	100,000	
Inner Marsh Slough	25,000	
Centerville Slough Berm		10,000
Angels Camp Berm		15,000
Inner Marsh Berm Improvements		2,000
Onsite Beneficial Reuse Opportunity Necessary to Balance cut/fill: • Agricultural upland application • Rehabilitation of existing berms and roads on EREP, Russ and/or adjacent O'Rourke Foundation properties • Tidal Marsh Hummocks		248,000
Dune Reconfiguration and Enhancement	50,000	50,000
Total	**325,000**	**325,000**

2.5 Project Implementation

2.5.1 Site Access and Staging

Primary access to the EREP portion of the Project area during construction and operation is via Russ Lane off of Centerville Road. Centerville Road is a two lane paved County road. Russ Lane is a single lane paved County road extending from Centerville Road to two deeded and connecting easements that extend from the end of Russ Lane approximately 1,400 feet to the EREP. As discussed under the Recreation chapter, these easements are the subject of a dispute between TWC and the Russ family. That dispute is discussed at length under the Recreation chapter. Access to the Russ portion of the Project area during construction and operation is via a private drive off of Centerville Road, or Centerville Beach parking lot via Centerville Road. Construction

equipment and materials would be transported to the work areas via these ingress/egress locations. During construction activities at specific locations, unimproved roads on top of dikes, and areas of pasture nearby, would be utilized for the duration of those specific work tasks. Construction equipment would not be stored in inundation areas or in sloughs. Construction staging areas would be indicated on construction documents. All areas disturbed by temporary staging and stockpiling would be de-compacted and naturalized as needed and prior to Project completion.

2.5.2 Utilities and Public Services

There are no public water or sewer utilities on site. PG&E supplies power to the Potato Barn, Quonset Hut, and a well. There are overhead power poles near this barn as well. There are no known public utility easements through the Project area for utilities, and there are no anticipated changes to utilities. The contractor would be responsible for supplying electrical power if needed for any construction activities and would be by means of a portable generator. There are no anticipated changes to public services such as law enforcement and fire protection.

2.5.3 Energy Usage and Conservation

During construction, energy would primarily be used in the form of diesel fuel in construction vehicles and equipment, and in generators. There would be minimal to no additional electrical use through the PG&E supply for construction. During grading, most sediment would be placed onsite, minimizing the energy consumption of trucking to offsite disposal locations. The contractor would be required to adhere to the Coastal Conservancy's Greenhouse Gas Reduction Best Management Practices (BMPs), except where such BMPs are determined to be infeasible.

Post-construction, daily activities would see a minor increase in energy consumption when interpretive activities become part of the EREP's operations. A ranger vehicle patrols the EREP portion of the Project once a day currently and this would continue into the foreseeable future. Battery-operated pressure transducers are in operation adjacent to tidegates. These may be temporarily taken out of operation if their positions interfere with construction activities, but would be reinstalled and operated post-construction for monitoring purposes.

The majority of the construction work would include excavation, grading, rock placement and channel armoring, planting, pre-cast bridge placement and construction of earthen berms. Typical earth moving equipment would be the majority of equipment used, including bulldozers, excavators, backhoes and small cranes. Other equipment and vehicles used would include dump trucks, concrete pump trucks, portable generator sets, and other various power and hand-tools. The Project would also require the delivery of equipment, workers, and materials via Centerville Road from the City of Ferndale.

The Project is designed to minimize the need for active sediment management, however, it is anticipated that heavy equipment could be used onsite for up to two weeks annually, post construction. Gravity and water is otherwise the primary mover of sediment for distribution across farmland, a key conservation feature of the Project.

Some electric cattle fencing is currently powered through solar energy. This is expected to remain in operation. The new tidegates proposed for the Project would be manually operated.

2.5.4 Construction Schedule and Duration

Project construction would be phased into multiple construction seasons based on available funding and sequencing earthwork with construction water management. Each season would last

approximately 120 days between May and October and is anticipated for the years 2017 through 2020. The downstream-most improvements such as tidegate installation would be included in the initial phase. Excavation of Centerville Slough, Russ Creek, and Shaw Creek, and related sediment placement would be included in subsequent phases as would dune restoration, planting and invasive species removal.

Construction would generally occur between the hours of 6:00 AM and 6:00 PM, Monday through Friday. Construction during the weekends would be subject to approval by the landowners and construction manager. It is anticipated that between 15 and 25 construction workers would be present on the Project site at any given time. The number of motor vehicles is anticipated to be up to 30 per day.

The multiple sediment reuse areas coupled with the extent of Project excavation are anticipated to necessitate multiple active staging and excavation sites within the Project footprint. Each work site may include excavators, graders, scrapers, dozers, loaders, dump trucks, small tractors, compactors, and water trucks. Each site may also include up to 15 workers. Table 2-2 shows the range of Project construction equipment estimates for construction phases. The equipment listed would be the primary noise generating equipment and emission sources throughout construction, which is anticipated to occur over three seasons. Post construction there would be no noise generating equipment or emission sources aside from those generated during monitoring and maintenance activities.

Table 2-2 Estimate of Equipment Needed for Project Construction

Equipment Type	Estimated Quantity
Excavators	2-4
Scrapers	1-3
Dozers	2-4
Loaders	1-3
Dump Trucks	2-8
Small Tractors	1-3
Compactors	1-2
Graders	1-2
Water Trucks	1-2

During excavation, management of the stream inflow from upstream tributaries; Russ Creek, Shaw Creek, and Creamery Ditch would be required through the construction period. Preventing inflow into the active work zones (both tidal and freshwater) would be required to reduce the nuisance water to be managed within the active work area. Inflow management would also reduce the moisture content in excavated soils and prevent aquatic and non-aquatic organisms from entering the construction area. Cofferdams would be used to isolate instream work areas that would be dewatered and stream flow bypassed downstream.

The cofferdams may be comprised of native material or washed gravel encased with an impermeable geotextile or visqueen liner in combination with ecology blocks and/or temporary sheetpiles pushed into the subsurface. A combination of pumped and/or gravity diversion pipes would be used to route flow around the active work areas. Fish screens would be installed

immediately upstream from the cofferdams to prevent aquatic organisms from being transported into the bypass pipe.

Construction activities would be conducted in compliance with applicable state and local requirements and in a manner that minimizes disturbance to adjacent properties and disruption to traffic. It is not expected that traffic control would be required as a component of this Project as access routes are limited. Sediment re-use is proposed to be contained within the Project area and so there would be no sediment off-haul. The material excavated from the Project site is anticipated to be free of hazardous materials.

2.5.5 Adaptive Management Program

Ongoing operations and maintenance activities would be necessary to assure long-term hydraulic and ecological functions of the overall Project. Maintaining the proposed Project facilities, including the channel, sediment management areas, drainage ditches, berms, dunes, invasive species, and water control structures requires optimizing drainage inflows to the system and integrating sediment and vegetation maintenance areas with existing surrounding land uses. Designated maintenance areas may require vegetation removal, ongoing planting and/or repeated excavation or reworking of deposited sediments.

Establishing a formal and predictable structure is fundamental to preserving the long-term social and biological integrity of the Project. An Adaptive Management Program (AMP) assists managers to respond to unanticipated changes to Project components including: hydrology, sedimentation, target habitat development, or species response along the restoration trajectory (NRC 2004). This Project would benefit from an AMP for a number of reasons. The watershed is situated in a region with a combination of relatively active tectonic regimes, highly erodible soils, the threat of sea-level rise, and high rates of annual precipitation. This creates an extremely dynamic natural system in which to work. An AMP is the most effective and flexible management tool for coping with the challenges that may arise during the Project. These challenges include, but are not limited to:

- The large scale of the Project
- The variety of habitats and hydrologic conditions
- The high initial disturbance to the ecosystem from Project implementation
- Interactions with on and off-site agricultural land uses
- The typical level of uncertainty associated with the evolution of ecosystem restoration projects
- Flood preparedness and response
- Climate variability and sea level rise.

Adaptive management is a systematic and iterative process that facilitates feedback between monitoring and management actions. The feedback mechanism is engaged when monitoring data are analyzed and the results incorporated to adjust Project operations in a manner that enhances the achievement of Project goals. Adaptive management employs a structured approach, yet it is also a flexible tool that can adjust to a dynamic environment through the evolution of a project. In this way, adaptive management helps to enable a project to meet its goals and objectives, in spite of the inherent variability that exists within natural systems.

Project performance thresholds and acceptable practices would be developed for future adaptive management measures to maintain performance of the overall Project. This component would be

most closely associated with tidal habitat enhancement, dunes and channel restoration, and includes identification of channel dimensions, channel maintenance access points, target habitat conditions, target tidal range, establishment of maintenance activities compatible with the overall Project goals and objectives, and BMPs for performing future channel and dune maintenance activities. The impacts associated with the anticipated operational and maintenance activities would be infrequent and short-term in nature. In addition, they are anticipated to be no greater than the traditional maintenance historically performed on these lands.

The AMP includes the following elements:

- The structure and responsibilities of the Project Management Team
- Responsibilities to identify/obtain funding for monitoring and adaptive management activities
- Monitoring program components for use in evaluating the results of Project implementation
- Triggering mechanisms or early stress indicators that would be used to alert the Project Management Team of the need to take action
- Potential adaptive Project management options once trigger thresholds have been reached
- Development of a conceptual model of adaptive management process.

The AMP will contain a chapter for water level management specific to the tidegate and water control structure operations. The AMP and WLMP will be developed concurrent with the Project EIR and permits, with specific operational guidelines. The AMP and WLMP will be completed in draft format and circulated prior to issuance of the EIR, and finalized prior to issuance of Project permits. The WLMP may be used as supporting information for potential revision of the existing drainage easement.

2.6 Required Permits and Approvals

The Project would likely require the following permits/approvals:

- County of Humboldt – Conditional Use Permit and Grading Permit
- California Coastal Commission – Coastal Development Permit
- California Department of Fish & Wildlife – Lake and Streambed Alteration Agreement, Incidental Take or Consistency Determination Process, and Consistency Determination for Salmonids with NMFS Biological Opinion
- North Coast Regional Water Quality Control Board – 401 Water Quality Certification
- U.S. Army Corps of Engineers – Clean Water Act Section 404
- USFWS and NOAA Fisheries – Section 7 Formal Consultation
- State Lands Commission - Lease

2.7 References

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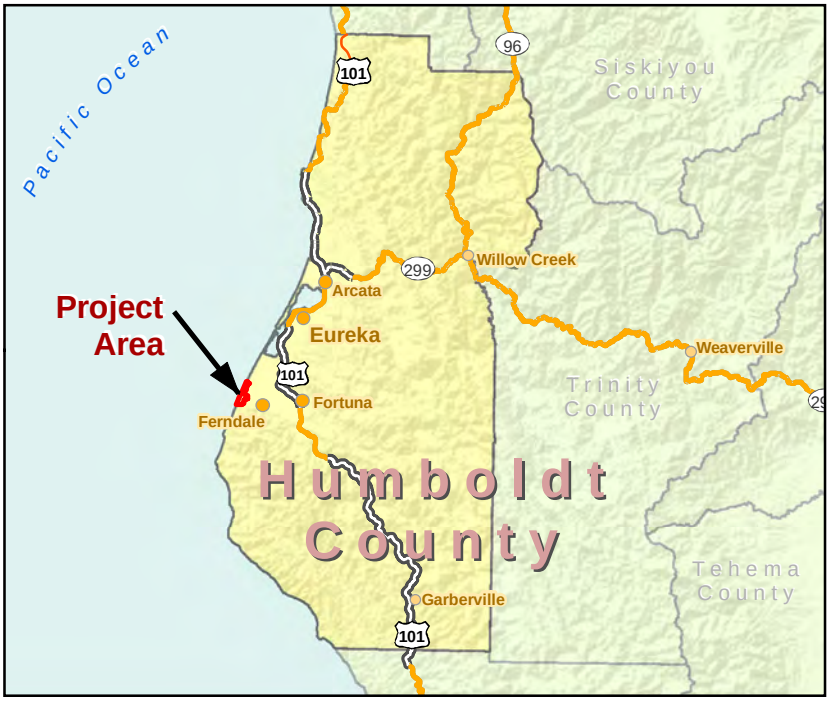

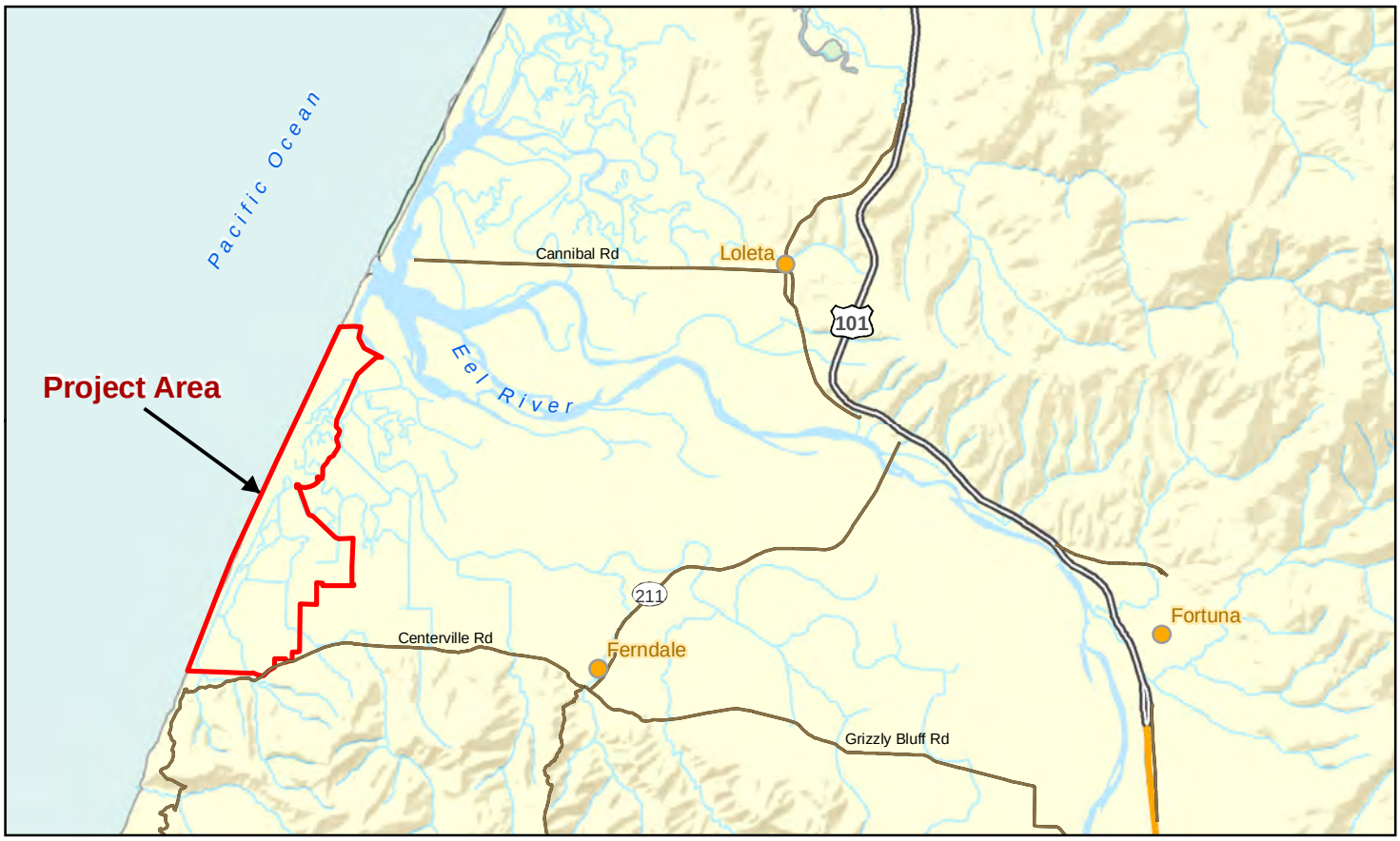

Project Area
Humboldt County
Counties
Freeway
Highway
Roadway
Waterways

Paper Size 8.5" x 11" (ANSI A)
0 0.5 1 2 3
Miles
Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

GHD

Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number	8410882.03
Revision	2
Date	04 Jan 2016

Project Area and Vicinity

Figure 2-1

718 Third Street Eureka, CA 95501 T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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Data source: USA Base Maps; USA Census; Humboldt County transportation data, 2008. Created by:jclark2

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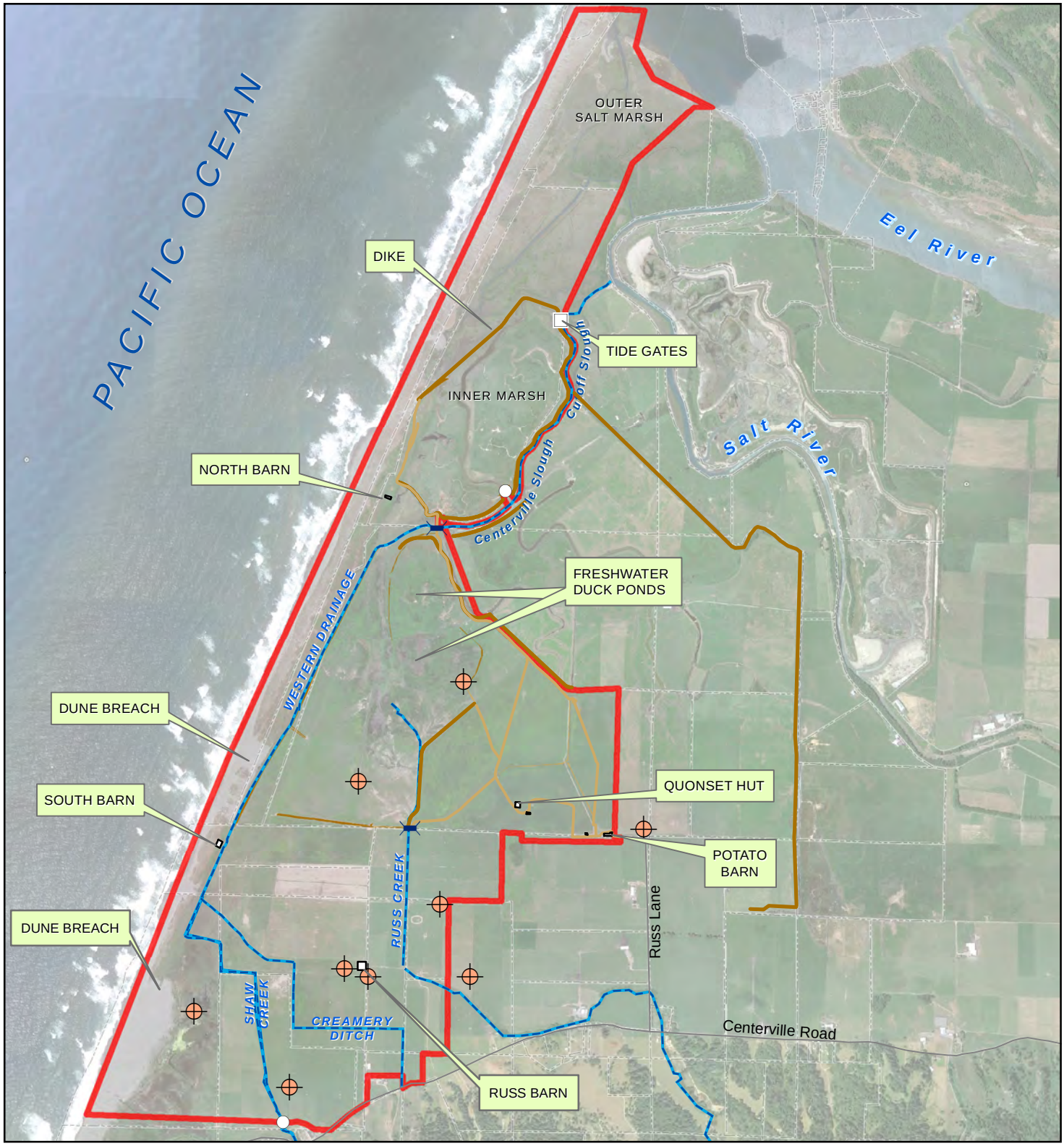

Existing Components

- Project Area
- Property Boundaries
- Bridge
- Buildings
- Local Roads
- Waterways
- Culvert
- Tidegate
- Well
- Access Roads
- Dike/Berm

Paper Size 8.5" x 11" (ANSI A)

0 1,000 2,000 3,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

N

Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number 8401072
Revision B
Date 06 Sep 2016

Project Area and Existing Conditions

Figure 2-2

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Data source: Google Earth Aerial, 2014; County of Humboldt: administrative boundaries. Created by:jclark2

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Project Boundary

Property Boundary (Reference: Humboldt County Parcel Data)

Paper Size 8.5" x 11" (ANSI A)

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

Eel River Estuary and Centerville Slough Enhancement Project

Job Number	8410882.03
Revision	A
Date	07 Sep 2016

Project Area Ownership

Figure 2-3

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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Data source: Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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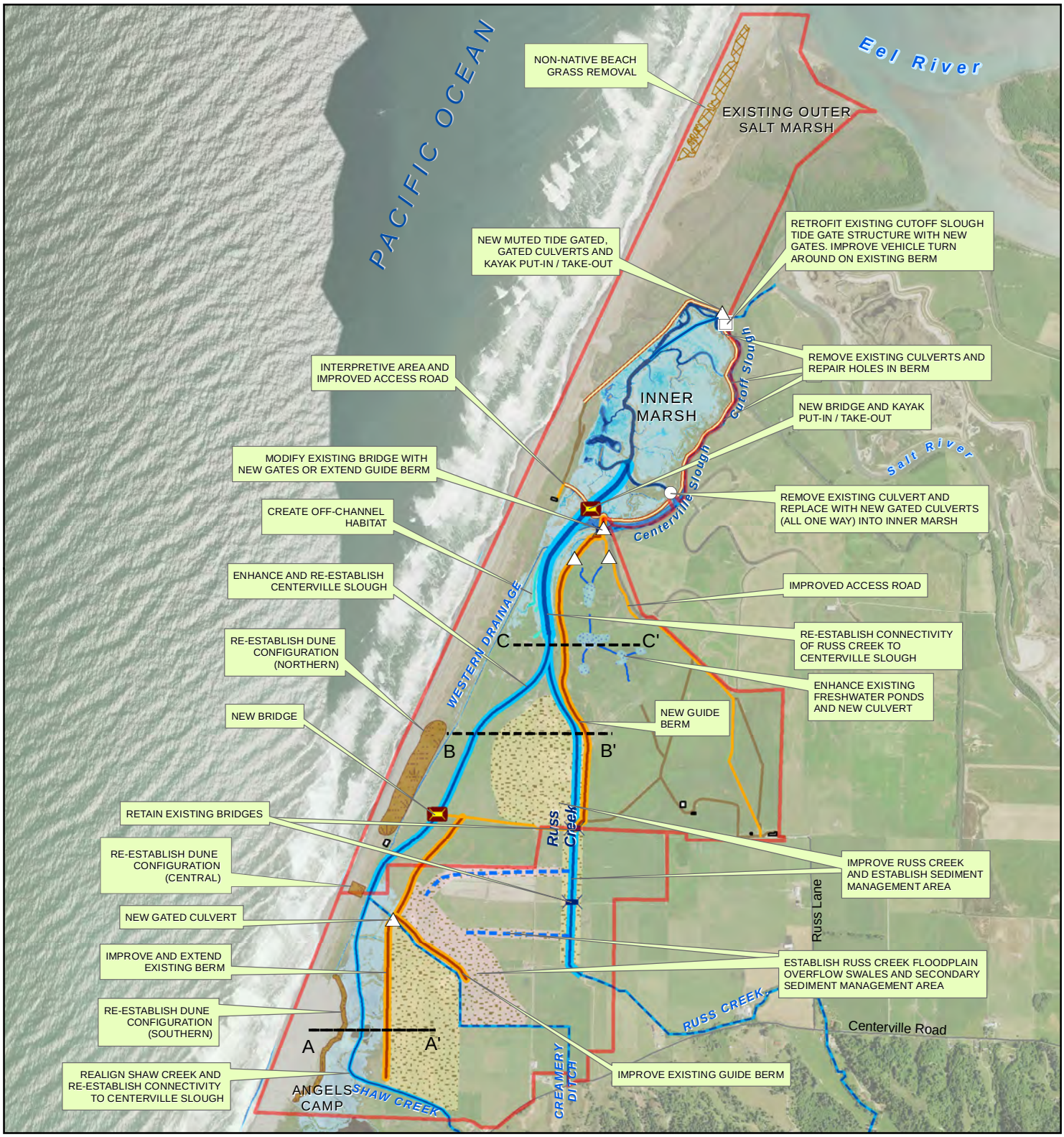

Existing Features

- Figure 2-4 Section Cuts
- Project Boundary
- Buildings
- Existing Drainage
- Existing Access Route

Proposed Project Components

- Replace Existing Culverts
- New Culvert/Tidegate
- Retrofit Existing Tidegate
- Proposed Bridge
- Improved Access Road
- Berm with Improved Access Road
- Proposed Berm / Guide Berm
- Channel Re-establishment
- Channel Realignment
- Floodplain Overflow Swale
- Freshwater Pond Conveyance
- Non-Native Beach Grass Removal
- Enhanced Freshwater Complex
- Brackish Off-Channel Habitat
- Primary Sediment Management Area
- Secondary Sediment Management Area
- Re-establish Dune Configuration
- Existing Ag Exclusive Area Available for Future Sediment Management

Seasonal Muted Tide Levels (Reference: NOAA Lidar)

- <2.5'
- <3.0'
- <3.5'
- <4.0'
- <5.0'
- above

Paper Size 8.5" x 11" (ANSI A)

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number	8410882.03
Revision	B
Date	18 Jul 2016

Project Components

Figure 2-4

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N:\US\Eureka\Projects\Legacy\Projects\1000298 CalTrout\8410882 EREP EcosystemEnhancement\08-GIS\Maps\Figures\DEIR\F2-4_Conceptual Project Components.mxd

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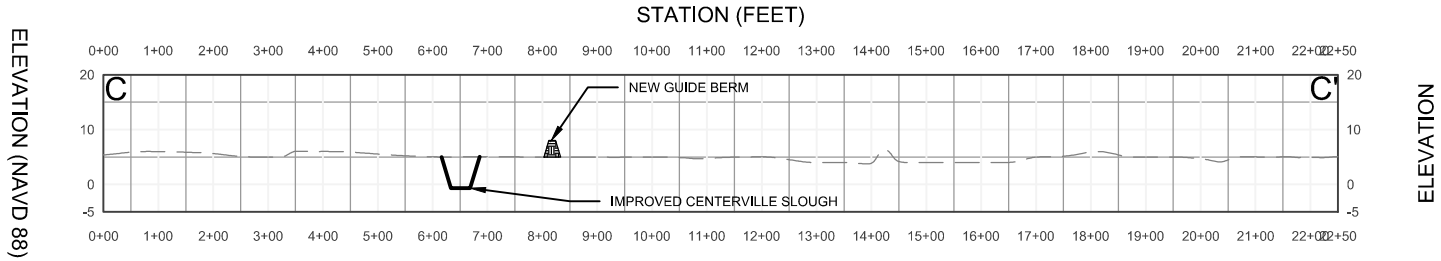
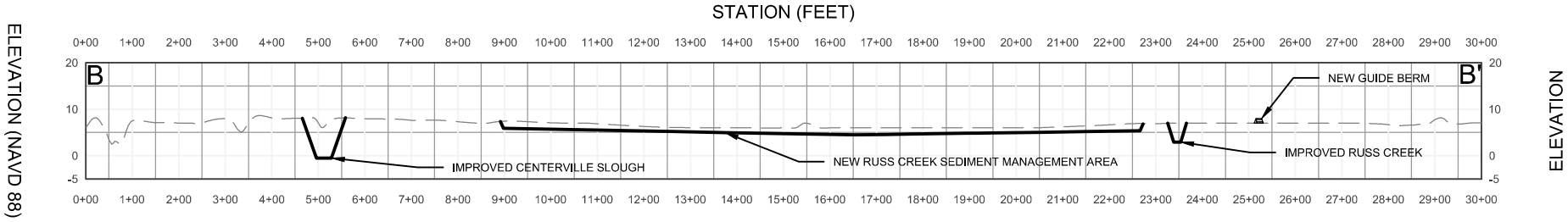
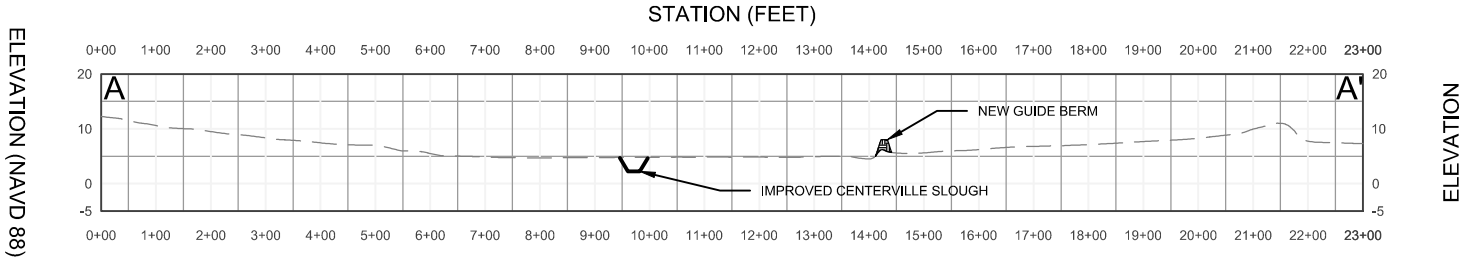


SECTION C: WEST - EAST



SECTION B: WEST - EAST



SECTION A: WEST - EAST

VERTICAL EX.: 10:1

SCALE: 0 350' 700' — HORIZONTAL SCALE

0 10' 10' — VERTICAL SCALE

Eel River Estuary and Centerville Slough Enhancement Project EIR

Project Area Proposed Condition Cross-Sections

Job Number 8410882
Revision A
Date 27 JAN 2016

Figure 2-5

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Plot Date: 18 July 2016 - 11:17 AM Cad File No: N:\US\Eureka\Projects\Legacy\Projects\1000298 CalTrout\8410882 EREP EcosystemEnhancement\06-CAD\Figures\X Sections.dwg

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3. Environmental Setting, Impacts, and Mitigation Measures

Scope of Analysis

This Draft EIR analyzes the potential effects of the proposed Project on the environment under the applicable environmental resource categories listed in the CEQA Initial Study Checklist (Appendix G of the CEQA Guidelines).

Each environmental resource area potentially impacted by the Project is addressed in the following sections numbered as follows:

- 3.1 Aesthetics
- 3.2 Agricultural Resources
- 3.3 Air Quality
- 3.4 Biological Resources
- 3.5 Cultural Resources
- 3.6 Geology and Soils
- 3.7 Greenhouse Gas Emissions
- 3.8 Hazards and Hazardous Materials
- 3.9 Hydrology and Water Quality
- 3.10 Land Use and Planning
- 3.11 Mineral and Energy Resources
- 3.12 Noise
- 3.13 Population and Housing
- 3.14 Public Services and Utilities
- 3.15 Recreation
- 3.16 Transportation

Each section of Chapter 3 contains the following elements:

Setting. This subsection presents a description of the existing physical environmental conditions in the Project area with respect to each resource area at an appropriate level of detail to understand the impact analysis. It describes existing conditions and provides a baseline by which to compare the potential impacts of the proposed Project.

Regulatory Framework. This subsection provides a brief discussion of applicable federal, State, and local regulations and policies that are relevant to the resource category.

Evaluation Criteria and Significance Thresholds. This subsection provides the significance thresholds for evaluation of environmental impacts. The significance thresholds are based on State CEQA Guidelines Appendix G.

Methodology. The methodology subsection discusses the approach to the analysis.

Impacts and Mitigation Measures. This subsection evaluates the potential for the Project to significantly affect the physical environment described in the setting. Potential impacts are identified and characterized, and where feasible, mitigation measures are identified to avoid or reduce significant impacts to a less-than-significant level.

Cumulative Impacts. Cumulative impacts are discussed in each environmental resource section following the description of the Project-level impacts and mitigation measures. The cumulative impact analysis is based on the same setting, regulatory framework, and significance thresholds presented in each resource category section. Additional mitigation measures are identified if the analysis determines that the Project's contribution to an adverse cumulative impact would be cumulatively considerable and, therefore, significant.

Significance Determinations

The significance thresholds for each environmental resource category are presented in each section of Chapter 3. For the impact analyses, the following categories are used to identify impact significance:

No Impact. This determination is made if a resource is absent or if a resource exists within the Project area, but there is no potential that the Project could affect the resource.

Less-than-Significant Impact. This determination applies if there is a potential for some limited impact on a resource, but the impact is not significant under the significance threshold.

Less-than-Significant Impact after Mitigation Incorporated. This determination applies if there is the potential for a substantial adverse effect in accordance with the significance threshold, but mitigation is available to reduce the impact to a less-than-significant level.

Significant and Unavoidable Impact. This determination applies to impacts that are significant, and mitigation has been incorporated, but the mitigation does not reduce the impact to less-than-significant and there appears to be no additional feasible mitigation available to reduce the impact to a less-than-significant level.

Environmental impacts are numbered throughout this EIR, using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond to the impact numbers; for example, Mitigation Measure 3.1-1 would address Aesthetics Impact 3.1-1. Where more than one mitigation measure is included to mitigate one impact the sequence of "a", "b," etc. is added (for example: Mitigation Measure 3.1-1a and Mitigation Measure 3.1-1b would both apply to Impact 3.1-1).

Cumulative Impacts

Cumulative impacts are defined as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts" (CEQA Guidelines Section 15355). Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time.

The cumulative impact analysis for each environmental resource category is described in the appropriate subsections of this Chapter, following the description of direct Project impacts and identified mitigation measures.

Approach to Cumulative Impact Analysis

Two approaches to the definition of the cumulative Project scenario are discussed in CEQA Guidelines Section 15130(b). The first approach is a list of past, present, and probable future Projects producing related or cumulative impacts. The second approach is a summary of

Projections contained in an adopted local, regional or statewide plan, such as a general plan or related planning document, or in an adopted or certified environmental document, which describes or evaluates conditions contributing to cumulative effects.

For this EIR, the cumulative Project scenario has been evaluated using the list approach. Table 3-1 lists relevant Projects used in the cumulative impacts analysis for each environmental resource topic.

List of Relevant Projects

Table 3-1 (Projects Considered for Cumulative Impacts) provides a list of the past (within two years), present, and reasonably foreseeable future Projects within and near the Project area, including a brief description of the Projects and their anticipated construction schedules (if known). Single-family homes and other similar small-scale uses were not included because of their negligible cumulative effects.

Table 3-1 Projects Considered for Cumulative Impacts

Project Name	Project Description	Estimated Construction Schedule	Project Location
Salt River Ecosystem Restoration Project	This Project is comprised of four major components: wetland and upland restoration on the 444-acre-Riverside Ranch property owned by the CDFW; erosion-reduction projects on private lands in the Wildcat Hills; excavation of a new Salt River channel, mostly on private lands; and long-term maintenance.	Under Construction (summer months), estimated completion in 2018.	Humboldt County near the City of Ferndale, California. The project area extends from approximately 1,800 linear feet upstream of the Salt River's confluence with Williams Creek downstream to the Salt River's confluence with Cut-Off Slough.
CDFW Eel River Wildlife Area Ocean Ranch Unit (ORU)	A feasibility study was completed in February 2016 for CDFW's Ocean Ranch Unit of the Eel River Wildlife Area. Key findings were: 1) tidal restoration in the Ocean Ranch Unit is feasible; 2) impacts to adjacent properties can be avoided while achieving the project goals and objectives, and; 3) restoration costs at Ocean Ranch Unit are comparable to other wetland restoration projects. The study identified four alternatives, two of which were determined to be most capable of achieving the project goals and objectives. These included a full tidal restoration and an alternative that involved breaching the area to McNulty Slough. However, all four alternatives and a no project alternative, remain under consideration. The concept of restoring habitat at ORU remains in the planning stages, and is	Currently in project planning stage.	Ocean Ranch, near Table Bluff.

Project Name	Project Description	Estimated Construction Schedule	Project Location
	anticipated to be so for several more years. It is unlikely that implementation would coincide with the proposed Project.		
Gravel Mining & Processing CUP14-015, SMP14-003, RP14-003	The proposed project would include a gravel mining and processing operation. The project includes a Conditional Use Permit, a Surface Mining Permit and a Reclamation Plan.	Approved by the Planning Commission on March 5, 2015. Gravel mining operations start date currently unknown.	Humboldt County, in the Ferndale area, east side of Williams Creek Road, approximately 0.33 mile southeast from the intersection of Williams Creek Road and Grizzly Bluff Road, on the property known as 255, 277, 475 and 597 Williams Creek Road.
Smith Creek Wetland Restoration Project – NRCS (Grinsell Property)	The 20 acres that were enrolled into the WRP program as flooded pasture ground that was previously grazed by cattle during portions of the year. This area also receives tidal influence up the Smith Creek branch. The project would consist of re-creating swales, removing existing berms, filling in existing conveyance ditches, and constructing a small berm with water control structures.	2017	Northwest of Ferndale, east of the Project site.
Smith Creek Wetland Restoration Project – NRCS (Walker Property)	The 88 acres that were enrolled into the WRP program existed as farmed hay fields that were created by filling in an existing swale that at one time used to be part of an established creek system. The main objective is to re-create the tidal marsh influence that had once existed. The project would consist of excavating and shaping the swale system back to its nearly natural condition, excavate shallow water habitat for the tidal influence, fill in an existing lower ditch to permit additional tidal influence, create upland areas from the excavated material and establish trees in those areas.	2017	Northwest of Ferndale, east of the Project site.
Eel River Gravel Extraction	The gravel extraction projects are seasonal extraction of various volumes of aggregate from six bars between Fernbridge and the lower Van Duzen for five years by Eureka Ready Mix, Humboldt County, Mercer Fraser, Hansen, and Leland Rock.	2015-2020	Between Fernbridge and the lower Van Duzen River.

Project Name	Project Description	Estimated Construction Schedule	Project Location
Upslope Sediment Reduction	Sediment reduction/erosion control actions in the upper Russ Creek and Shaw Creek watersheds are ongoing with landowners. These actions primarily include improving road drainage as well as channel restoration, riparian planting, bank stabilization, livestock fencing, and modification and removal of fish barriers. These efforts are primarily intended to improve water quality in the lower Eel River, while enhancing the hydrologic function to reduce turbidity or sediment load and resulting sediment deposition in the lower watersheds. Most projects are landowner led with technical and cost share assistance from the NRCS.	Ongoing	Upper Russ Creek and Shaw Creek Watersheds.
Project Area Maintenance Prior to Construction	Storm damage maintenance of existing facilities such as sediment removal from drainages, culvert and tidegate repairs.	Ongoing until completion of the Project.	Throughout the Project area.
Ongoing Maintenance or other activities outside the Project Area but within the Shared Dike Basin	Specific activities are currently unknown but could include existing berm and tidegate/culvert repairs/replacement.	Ongoing	Outside the Project area but within the shared diked sub-basin (e.g. Occidental Ranch).

Source: GHD, Humboldt County, 2015.

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3.1 Aesthetics

This section evaluates the potential impacts related to aesthetics and visual resources during construction and operation of the proposed Project activities. To provide the basis for this evaluation, the Setting section describes the existing scenic resources and visual character for the Project area and the Regulatory Framework section describes the regulatory background that applies to the Project. Aesthetic issues addressed include scenic vistas, scenic resources, visual character and quality, and light and glare.

3.1.1 Setting

The following text describes the existing visual character of the Project site and surrounding land. The descriptions of existing conditions are accompanied by photographs of representative views taken during multiple site visits from 2012 through 2015. The locations and viewpoints of each image are shown in Figure 3.1-1.

Visual Character of the Project Site

The Project site includes views of salt marsh lands (i.e., Inner Marsh) from the central portion of the site north to the Eel River. Cut-Off slough, Centerville Slough, Russ Creek, Western Drainage Ditch, Shaw Creek, and Creamery Ditch are visible from within the Project site. The Project site includes broad views of pasture land adjacent to Centerville Slough to the east. The North and South barns are connected by unimproved roads to the Headquarters Barn at the EREP entrance. Watering troughs and fencing are also visible throughout the Project site.

Dunes are visible along the Project site's western boundary from the mouth of the Eel River south to Angels Camp. There are three areas within the dunes where wave overwash events have compromised dune stabilities. These areas are known as "blow out sites." There is a northern dune blowout site and central dune blowout site that are within the EREP portion of the Project. The largest dune blowout site is within the Russ property portion of the Project just west of Angels Camp and north of Centerville Beach.

Visual Character of the Surrounding Area

The Project site is surrounded by a working landscape of pasturelands with the Wildcat Hills to the south, the hills of Loleta and Table Bluff to the north, the coast range to the east and the Pacific Ocean to the west. Surrounding vistas include agricultural pasture land immediately to the east; forested hillsides farther to the south and east; the Eel River corridor to the north; and flat bottomlands surrounding and adjacent to the Project site. In the distance, rural residential homes, and agricultural operations and ancillary buildings are visible. Rural roads are also visible in the distance to the east of the Project site.

Site Photographs

Images 3.1-1 through 3.1-7 show various viewpoints from within the Project site. The photographs were taken between 2012 and 2015. Figure 3.1-1 shows the general location and direction of each image.

Image 3.1-1: Dunes and dune over-wash, Western Drainage Ditch (far right) looking northeast.

Image 3.1-2: Inner marsh (left), dike and road (center), Outer saltmarsh and dunes (far right) looking southwest.

Image 3.1-3: Cut-Off Slough and Inner marsh dike looking northwest.

Image 3.1-4: Duck pond, Headquarters barn and Wildcat Hills in the distance looking south.

Image 3.1-5: Russ Creek flood and sediment deposits looking north.

Image 3.1-6: Russ Creek and pasture looking north.

Image 3.1-7: Pasture looking south towards Angles Camp.

3.1.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project related to visual resources in Humboldt County.

State

California Coastal Act

The California Coastal Act was enacted by the State Legislature in 1976 and is the primary law that governs the decisions of the Coastal Commission. The Coastal Zone encompasses 1.5 million acres of land, and stretches from three miles at sea to an inland boundary that varies from several blocks in urban areas to as much as five miles in less developed areas. Covering 1,100 miles of California coastline from Oregon to Mexico, including 287 miles of shoreline surrounding nine off-shore islands, the Coastal Zone extends into federal waters under the Federal Coastal Zone Management Act. The California Coastal Act outlines, among other things, standards for development within the Coastal Zone.

Section 30251 (Scenic and Visual Qualities) under Article 6 (Development) of the California Coastal Act, states, “the scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas.”

Regional and Local

County of Humboldt General Plan Policies

The *Eel River Area Plan* of the *Humboldt County Local Coastal Program* contains the following policies related to scenic resources:

3.4.2 Visual Resource Protection

30251. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural landforms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

30253. New Development shall:

(5) Where appropriate, protect special communities and neighborhoods which, because of their unique characteristics, are popular visitor destination points for recreational uses.

3.42 E. Natural Features

Significant natural features within the Eel River Planning Area, and specific protection measures for retention of these resources are as follows:

Area	*Scenic Protection*
Eel River and associated riparian vegetation	*Eel River and riparian protection policies (Sec. 3.41F)*
Eel River Delta bottomlands	*Designated Agriculture Exclusive which encourages continuation of current agricultural activities and prohibits conversion to non-resource dependent activities.*

3.1.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to aesthetics resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings; or
- Create a new source of substantial light or glare which would adversely affect day or night-time views in the area.

Areas of No Project Impact

As explained below, construction and operation of the Project would not result in impacts related to two of the significance criteria identified in Appendix G of the current CEQA Guidelines as

mentioned above. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings and historic buildings within a State scenic highway?** There are no officially designated state scenic highways within Humboldt County within the Project vicinity (Caltrans 2011). Highway 101 throughout Humboldt County is eligible, but not officially designated. Therefore, the significance criterion related to substantially damaging scenic resources within a State scenic highway is not applicable to the proposed Project and is not discussed further.
- **Would the Project create a new source of substantial light or glare which would adversely affect day or night-time views in the area?** The Project would not include any new lighting or reflective surfaces that would cause glare. Nighttime construction work would not occur. No lighted structures would be developed as part of any of the Project components. The existing minimal light and glare from the Headquarters Barn and Quonset Hut would remain unchanged with Project conditions. Therefore, the proposed Project would have no impacts from light and glare.

3.1.4 Methodology

The visual impact analysis below evaluates the physical changes that would occur at the Project site using the standards of quality and consistency typically used for a visual assessment. The potential for changes to views from visually sensitive land uses also is evaluated. The visual impacts are compared against the thresholds of significance discussed above.

3.1.5 Impacts and Mitigation Measures

Impact AES-1: Would the Project have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character of the site and surroundings.

A scenic vista can generally be defined as a view that has remarkable scenery or a broad or outstanding view of the natural landscape. These conditions do exist at the Project site and in the surrounding area and include pasture (grazing) land, tidal salt marsh, brackish marsh, riparian areas, sloughs/open water channels, freshwater ponds and nearshore dunes. The project would have short-term impacts to these aesthetic and visual resources due to channel, culvert and tidegate construction, installation of new bridges, wetland creation or reestablishment, enhancement of freshwater ponds, elevation of agricultural uplands, berm improvements, dune re-establishment, removal of non-native beach grass (approximately 10 acres), and expansion of the tidal prism in the Inner Marsh. Short-term impacts to the visual character of the site would result from the presence of heavy equipment, soil excavation/exposed soil, soil stockpiles, temporary roads for transporting construction material, dune re-establishment, removal of vegetation and potential damage to the existing vegetation. Sediment disposal on agricultural lands would temporarily change their visual character, but that change would be consistent with typical agricultural operations and therefore would not be significant. Construction activity, such as the operation of heavy equipment and material storage, would temporarily change the visual character of the area; however, these effects would be temporary and it is anticipated that areas disturbed by construction activities would either revegetate naturally or be seeded with a pasture mix. Removal of non-native beach grass on the dune strand west of the Outer Salt Marsh and dune re-establishment to equal heights of the existing surrounding dunes at the TWC blowouts and a lower

berm on the east side of the Russ blowout would be visually inconceivable from adjacent properties and Centerville Road due to the distance, existing vegetation and height similarity to surrounding dunes. Revegetation of other habitat types such as riparian or scrub shrub either passively or actively would be visually similar to those habitats that currently exist along Russ Creek and Cut-off Slough within the Project area. Therefore, construction would not cause a permanent effect on the aesthetic quality of the area. The community of Ferndale is approximately four miles east of the Project site and construction activities would only be visible from a few residences in the Project vicinity or along Centerville Road. The enhancements throughout Project implementation in addition to the creation of a trail and boardwalk and kayak put in/take outs would provide passive recreation activities. Therefore, development of the proposed Project activities would not have a substantial adverse effect on a scenic vista. Operational impacts such as managing the avulsion areas, excavating sediment from drainages and road/berm repair would not result in substantial adverse effects. The impact to scenic vistas would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.1.6 Cumulative Impacts

Impact AES-C-1: Would the Project plus cumulative projects contribute to a cumulatively considerable contribution to cumulative impacts related to visual resources.

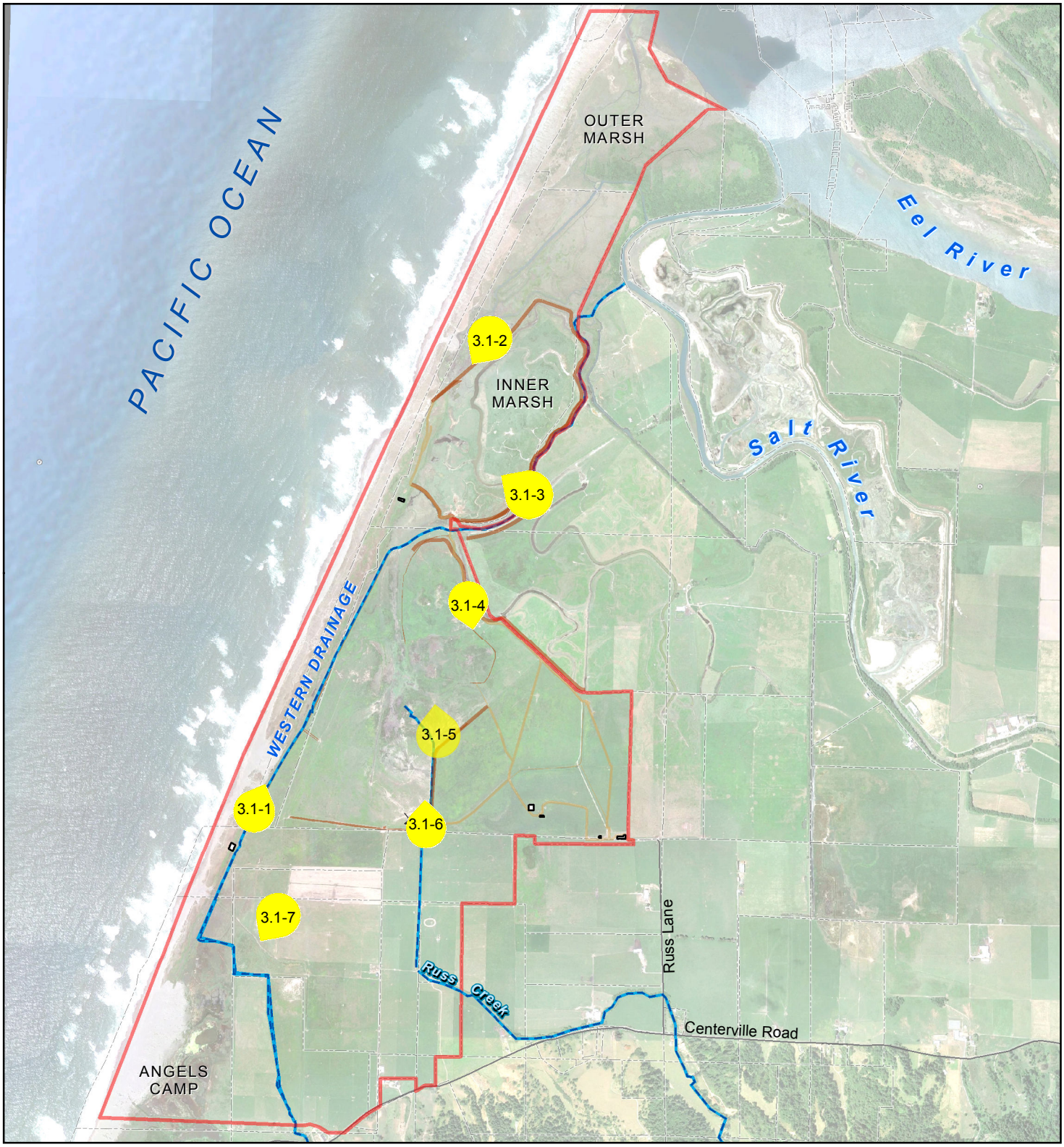
The impacts from construction and operation of the Project to scenic vistas, visual character, and light/glare are not cumulatively considerable because impacts to a scenic vista or visual character would be dependent upon Project- and site-specific variables, including proximity to visually sensitive receptors, the visual sensitivity of the respective development sites, and the operational characteristics of each development site. The potential impacts of other Projects on a scenic vista or visual character of a development site and its surroundings would be evaluated on a project-by-project basis. It is assumed that cumulative development would progress in accordance with the Zoning/Development Code of the respective jurisdictions. Each Project would be analyzed in order to ensure that the construction-related Zoning/Development Code restrictions are consistently upheld. Cumulative impacts to a scenic vista or visual character would not be cumulatively considerable.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.1.7 References

California Department of Transportation (Caltrans), 2011, California Scenic Highway Program, accessed website on October 15, 2014 at: http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm.



LEGEND

- Project Area
- Buildings
- Parcel Boundaries
- Existing Drainage
- Local Roads
- Existing Access Roads
- Existing Levee/Berm

3.1-1: Dunes and dune blowout, Western Drainage Ditch (far right)
3.1-2: Inner Marsh (left), dike and road (center), Outer Salt Marsh and dunes (far right)
3.1-3: Cutoff Slough, dike and Inner Marsh
3.1-4: Duck pond. Headquarters barn in distance
3.1-5: Russ Creek flood and sediment deposits
3.1-6: Russ Creek and pasture

Paper Size ANSI A
0 750 1,500 3,000 Feet
Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number	8410882
Revision	C
Date	06 Sep 2016

Photo Viewpoint Locations

Figure 3.1-1

718 Third Street Eureka CA 95501 USA T 1 707 443 8326 F 1 707 444 8330 E eureka@ghd.com W www.ghd.com

G:\Legacy\Projects\1000298 CalTrout\8410882 EREP EcosystemEnhancement\08-GIS\Maps\Figures\DEIR\F3.1-1_ProjectMap_PhotoViewpoints.mxd

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Data source: Parcel and Property Boudaries: Humboldt County Parcel Data. Created by:jclark2

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3.2 Agricultural Resources

This section evaluates the potential impacts related to agricultural resources during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the physical context, the historical context, the existing agricultural uses, current agricultural challenges, Project goals and objectives, prime farmland evaluation and prospective agricultural production for the Project area. Descriptions in this section are based on a variety of sources including soil studies, surveys, vegetation studies, livestock stocking rate records, forage production rate records, interviews with agricultural land managers, and reviews of published information, reports, and plans regarding agricultural resources. The Regulatory Framework section describes the applicable federal, state and local regulations affecting the Project area and the proposed Project. The evaluation criteria, impacts, and mitigation measures sections establish the thresholds of significance, evaluate potential agricultural resource impacts, and identify the significance of impacts and feasible mitigation measures if necessary. Several key resources informed the development of this section.

A *Technical Memorandum of Soil and Vegetation Data Collection in Support of EREP Agricultural Analysis (GHD 2013)* quantified existing conditions and informed the analysis of agricultural impacts. The basis of this memorandum was a field survey conducted November 11-12, 2013. The widespread sampling locations were selected with three goals in mind. First, the sites were broadly distributed across the TWC property in order to validate Natural Resources Conservation Service (NRCS) soil maps and accurately characterize the diversity of soil type, vegetation type and productivity on the site. Second, sites were located in order to compare and contrast the soil qualities of reclaimed areas with sites that reflect historic conditions, such as remnant slough channels or terminal ponds. Third, sites were distributed to characterize areas potentially impacted by Project elements, and to provide data sufficient to help avoid or diminish impacts to prime agricultural soils.

This technical memorandum was augmented by two quantitative analytical tools. First, the authors utilized a spreadsheet based quantitative tool entitled the *Eel River Estuary Preserve Agricultural Analysis (Coastal Conservancy 2016).* Serving as an agricultural baseline assessment, this spreadsheet-based quantitative tool was utilized to determine probable Project impacts/benefits to agricultural land resources on the Project area while providing supporting information for the EIR. This analysis made use of the aforementioned technical memorandum, stocking records, production rate records, interviews, soil maps and other sources in order to evaluate potential impacts of the proposed Project.[1] Second, to validate the findings of the spreadsheet, the authors utilized GIS based estimates of the range of productivity across the Project area in order to evaluate Project impacts to agricultural resources. This GIS based exercise set general productivity rates for the Project area based on the same sources as the spreadsheet based exercise, namely stocking rate records, production rate records, interviews, soil maps, vegetation maps and other sources. Close agreement between these two sources provided strong validation for general assumptions about Project impacts to agricultural resources.

[1] An important interview fundamental to the overall evaluation in this section was conducted November 11, 2013. This interview included TWC, their lessee, field scientists and Coastal Conservancy staff. Subsequent to that interview, the landowner submitted a variety of records to inform the interview and help substantiate this analysis. These submitted materials included stocking records, improvement and maintenance records, site survey records, photographic documentation of pasture condition, and oral and written descriptions of pasture management trends and challenges.

Also of assistance in the development of this section was the Agricultural Resources Investigation of the Salt River Ecosystem Restoration Project; Located Near Ferndale, Humboldt County, California (Humboldt County Resource Conservation District 2012).

Finally, it is noted that the relative paucity of data from Project lands south of the EREP has compelled the analysts and authors to extend onto RR&T lands conclusions about productivity and impacts on those lands based on the abundance of data and analysis performed on the EREP.[2] This approach was presented and discussed at length at an agricultural resources meeting January 14, 2016. Participants in that meeting included SCC, the landowners and GHD. Collectively, the group determined that: a) the analytical approach used to evaluate agricultural impacts on the Salt River Ecosystem Restoration Project was helpful as a starting point for use on the Project; b) the range of values for dry matter production expressed in the Salt River analysis were a reasonable and helpful starting point for evaluating the Project area; c) using vegetation as a primary indicator of productivity, then validating or testing that finding secondarily with soil type evaluations and other sources is prudent; d) agricultural conditions on the southern portion of the EREP were comparable and suitable for extrapolation to those of the RR&T properties; e) the agricultural analysis of property south of EREP would be best served by treating Angels Camp as one area devoid of agricultural productivity, capacity or potential, and; f) remaining RR&T land would be considered highly productive, with the exception of existing swales or ditches experiencing ponding and lower productivity.

3.2.1 Setting

Physical Context

The 1,838 acre Project area is located near Ferndale, Humboldt County. The area is bounded by the Pacific Ocean, the Eel River, Cut-off Slough and Centerville Road at the base of the Wildcat Hills. Much of the Project area consists of lands reclaimed in the late nineteenth century. Described in detail in the Project Description, the area includes an assemblage of landscape features that reflect a strong tradition of ambitious land conversion and intensive agricultural management over the last 150 years. Comparisons of historic maps to current conditions suggest that in 1854 the entire EREP was salt marsh, and much of the land to the south was a wetland complex classified as “Alder Land,” “Prairie,” or “Swamp and Overflowed Land,” implying an early intent to reclaim swamp under the existing land reclamation laws of the day. By 1889 the entire salt marsh, formerly State lands, had been reclassified as “Swamp and Overflow Land” facilitating legal reclamation. Nonetheless, until 1916, many of the historic features remained on the landscape, despite the reclassification and reclamation efforts (Figure 3.2-1).

By the present day most of the Project area had been converted to pasture, including the infilling of numerous sloughs and channels that comprised the historic Occidental Marsh. Centerville Slough largely disappeared between 1889 (Figure 3.2-2), and the present (Figure 3.2-3). Otherwise, present day features of the Project area range from the purely anthropogenic to surprisingly intact remnant habitat features that appear to have withstood reclamation, plate tectonics, subsidence, uplift, and at least two major flood events. Anthropogenic features include hundreds of acres of reclaimed salt marsh now serving as pasture, barns, roads, bridges, water control structures, man-

[2] A scoping meeting for a Project originally limited to the EREP was held in Fortuna January 12, 2015. Prior to that time, adjacent landowners declined to participate in the Project. However, in August 2015 those same landowners requested that the Project scope extend beyond the EREP then-defined Project area to include adjacent properties. This caused a disparity in the level of analysis performed to date for the Project. Therefore, additional data was collected to determine the feasibility of this extension of the Project area, and the proposed and expanded Project was re-scoped and a public scoping meeting was held December 9, 2015.

made freshwater ponds, duck blinds, berms and levees. Remnant landscape features include the Centerville Dune Complex, unfilled portions of historic Centerville Slough, Cut-off Slough in its entirety, Jack Slough, multiple mudflat/terminal ponds, numerous micro-channels associated with the Centerville Slough complex generally, and the Outer and Inner marsh areas particularly (Figure 3.2-3).

Some historically reclaimed features have returned to near original condition due to natural events. The most prominent example of this trend is the Angels Camp area, an approximately 200 acre area located on RR&T property. This area, bounded by pasture and the Pacific Ocean, completely reverted to salt marsh along the historic alignment of Centerville Slough following numerous wave over-wash events. Detailed data regarding vegetation communities and alliances frequently indicates or reinforces impressions of historic or anthropogenic landscape features. All vegetation features are summarized in Table 3.2-1 and graphically illustrated on Figure 3.2-4.

Soil Mapping

A Soil Summary Map denoting soil types, salinity sampling locations and pastures (Figure 3.2-5) was created based on NRCS soil map units mapped and salinity measurements conducted in the Project area. An accompanying table, “NRCS Soil Map Units and Acreage” (Table 3.2-2) provides detail to the map. Together, these provide the location of each soil map unit, along with a quantification of areas designated by NRCS as Class I or Class II. Class I or II land use capability classifications [LCC] by definition, qualify as prime agricultural land per California Government Code Section 51201(c). The subject of “prime” status and productivity is discussed at length, below. Additionally, areas greater than LCC II are depicted. These may or may not meet the definition of prime agricultural land, depending on other soil and productivity characteristics of these locations. Storie Index ratings, another NRCS metric, are not available for all areas of the site.

Extensive soil sampling was conducted on EREP in November 2014. Additional sampling took place on Russ properties by NRCS in 2015. The results provide guidance for inferring soil and productivity results throughout the Project area. Soil sampling locations are depicted on the Soil Summary Map (Figure 3.2-5). Representative samples were taken from each of the designated pastures on EREP. Soil sampling locations were also sited to include representative samples from each of the primary soil map units on the site, as well as within a diversity of the onsite vegetation types. A summary of relevant analytical results from the soil sampling are presented in the Soil Salinity and Fertility Analysis (Table 3.2-3). Table 3.2-3 focuses on presenting results that are helpful/relevant to productivity of the site, with primary focus on salinity metrics [pH, electrical conductivity (EC), sodium adsorption ratio (SAR), and exchangeable sodium percentage (ESP)] and subsequent salinity classification. Additionally included on this figure is the sample description that provides the sample approach for selection of each sample location.

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Table 3.2-1 Pasture Vegetation Detail Table

	Agricultural Use															
Vegetation Summary Vegetation Alliances	Russ Pasture 1	Pasture 2	TWC 100 Acre	70 Acre	Access Route Pasture	Duck Club	North Barn	North Levees	Quonset	Sick Pen	Western 40	Western Pastures	Williams	Pasture Total	Non-Pasture Not Grazed	Grand Total (Acres)
Pasture and/or Agricultural Wetland	**11.5**	**330.7**	**87.8**	**67.2**	**5.5**	**62.8**	**7.1**	**47.7**	**48.2**	**7.4**	**46.5**	**167.1**	**44.4**	**934.0**	**31.4**	**965.3**
Agrostis stolonifera					2.3		2.5							4.8	7.5	12.3
Agrostis stolonifera - Argentina egedii		0.0	80.3		2.0	12.5			30.9	4.6		62.8		193.1		193.1
Agrostis stolonifera - Distichlis spicata	9.6	0.1	4.7	67.2	1.0	30.0	4.6	47.1				39.8		204.1	18.1	222.2
Festuca perennis	0.9	0.3							17.3	2.8	46.5	24.8	44.4	137.1	5.8	142.9
Holcus lanatus	0.6	0.0												0.7		0.7
Managed Pasture		330.2												330.2		330.2
Potentilla anserina ssp. pacific	0.4		2.9		0.2	20.3						25.7		49.5		49.5
Ruderal								0.6				14.0		14.5		14.5
Freshwater Emergent Herbaceous	**2.5**	**7.1**	**6.3**		**1.1**	**61.0**	**0.0**	**0.2**				**10.6**		**88.8**	**3.7**	**92.5**
Eleocharis macrostachya	0.0	1.4			1.1	24.6						0.7		27.9		27.9
Juncus effusus	2.4	5.7	6.3					0.0				0.7		15.1	0.4	15.5
Juncus lescurii						7.6								7.6		7.6
Rumex crispus												9.2		9.2		9.2
Schoenoplectus pungens	0.0					28.8	0.0	0.2						29.0	3.2	32.2
Tidal Wetland (Saltmarsh/Brackish Herbaceous)	**69.5**	**6.9**	**0.2**	**2.0**		**3.0**	**4.5**	**12.8**				**1.0**		**99.9**	**183.8**	**283.7**
Atriplex prostrata-Cotula coronopifolia		0.0	0.2	0.6		2.0						0.1		2.8	0.3	3.1
Bolboschoenus maritimus	0.1							0.2				0.6		0.9	3.3	4.2
Deschampsia caespitosa														0.0	2.8	2.8
Distichlis spicata		0.2		0.4				0.3						0.9		0.9
Sarcocornia pacifica	69.4	6.7		1.1		1.0	4.5	12.3				0.4		95.4	17.7	113.0
Sarcocornia pacifica Complex														0.0	143.0	143.0
Spartina densiflora Complex														0.0	16.8	16.8
Dune	**61.9**						**20.4**	**2.2**						**84.5**	**195.1**	**279.6**
Abronia latifolia - Ambrosia chamissonis	0.1													0.1		0.1
Ammophila arenaria	3.1													3.1	117.0	120.1
Beach	50.5													50.5	56.4	106.9
Beach/Ammophila	8.0													8.0		8.0
Juncus breweri	0.3						20.4	2.2						22.9	21.6	44.5
Tree and Shrub		**0.9**										**0.9**		**1.8**	**30.4**	**32.2**
Alnus rubra - Salix hookeriana		0.9												0.9		0.9
Baccharis pilularis														0.0	20.0	20.0
Salix hookeriana												0.9		0.9	10.4	11.3
Other Non-Agriculturally Productive	**4.5**	**18.1**	**2.8**	**2.8**	**1.8**	**1.5**	**0.4**	**11.8**	**1.1**	**1.7**	**0.2**	**7.8**	**1.5**	**56.2**	**40.2**	**96.4**
Bare Ground	0.1	1.5					0.1	0.3	0.4					2.4		2.4
Development		1.2			0.0	0.0	0.1		0.0	0.9			0.0	2.3	0.3	2.6
Ditch	0.8	4.1										2.0		6.9	3.2	10.1
Improved Road		0.5	0.4		1.8				0.7	0.8			0.5	4.6	0.1	4.7
Mudflat														0.0	8.4	8.4
Open Water		4.1					0.2	0.1						4.4	3.6	8.0
Slough	3.4			2.8	0.0	0.1		5.4						11.8	18.3	30.1
Unimproved Road	0.0	2.5	1.3		0.0	0.3		0.5					1.0	5.6		5.6
Upland Ruderal	0.1	4.3	1.1		0.0	1.1		5.6			0.2	5.8		18.2	6.2	24.5
Unmapped	**1.5**	**85.9**						**0.0**					**0.2**	**87.7**	**1.3**	**89.0**
Grand Total (Acres)	**151.4**	**449.6**	**97.1**	**72.1**	**8.5**	**128.2**	**32.4**	**74.7**	**49.3**	**9.2**	**46.7**	**187.5**	**46.1**	**1352.8**	**485.8**	**1838.7**

Table 3.2-2 NRCS Soil Map Units and Acerage

NRCS Prime	Map Symbol	Map Unit	Square Feet	Acres	Classification	NRCS Hydric List	Land Capability Class (LCC)		NRCS Farmland Classification	Location	Pasture
							Irrigated	Non Irrigated			
*	**105**	**Worswick**	9,110,583	209.2	Coarse-loamy, mixed, superacrtive, nonacid, isometric Fluvaquentic Endoaquepts	Yes	5w	5w	Prime farmland if irrigated	South barn	W 40 / W Pasture / Pasture 2 / Pasture 1 / non ag
*	**110**	**Weott**	15,003,852	344.4	Fine-silty, mixed supearactive, nonacid, isomesic Fluvaquentic Endoaquepts	Yes	5w	5w	Prime farmland if irrigated	Russ Creek	100 ac / W Pasture / Duck Club / Quonset / Pasture 2 / Pasture 1 / Access / W 40 / Williams / non ag
	117	Swainslough-Occidental	6,584,568	151.2	See below	Yes	5w	5w	None	Old Russ	Duck Club / W Pasture / 100 ac
*	**126**	**Loleta**	6,103,007	140.1	Fine-loamy, mixed, superactive, isomesic Fluvaquentic, Endoaquolls	Yes	6w	6w	Prime farmland if irrigated	HQ barn	Williams / Quonset / Sick Pen / Pasture 2
	130	Fluvents-Riverwash Complex	4,210,395	96.66	None	No	None/6w	6w/8	None	cutoff slough	non ag / N Levee / Duck Club / 70 ac / Access
	140	Occidental	20,324,767	466.59	Fine, mixed, superactive, nonacid, isomesic Fluvaquentic Endoaquepts	Yes	7s	7s	None		70 ac / N Levee / W Pasture / Outer Marsh / W 40 / Access / N Williams / Duck Club / N Barn / non ag / Pasture 1 / Pasture 2
	141	Wigi	6,270,219	143.9	Fine, mixed, superactive, nonacid, isomesic Typic Halaquepts	Yes	7s	7s	None	outboard marsh	non ag / N levee
*	**116**	**Swainslough**	78,725	1.8	Fine, mixed superactive, nonacid, isomesic Fluvaquentic Endoaquepts	Yes	5w	5w	Prime farmland if irrigated	minor / N of HQ	minor / Williams
*	**119**	**Arlynda**	371,488	8.5	Fine-silty, mixed, superactive, nonacid, isomesic Fluvaquentic Endoaquepts	Yes	5w	5w	Prime farmland if irrigated	minor / W of HQ	minor / Quonset / Pasture 2 / Sick Pen
	155	Samoa-clambeach-dune land complex	10,731,892	246.4	None	No	None	6e/8	None	dunes	N barn / N Levee / Pasture 1 / non ag
	157	Beaches-samoa-dune land complex	1,335,028	30.6	None	No	None	8	None	beach W of site	non ag / Pasture 1
			TOTAL (LCC >2)	**1,839.4**							
			TOTAL (LCC </=2)	**0.0**							
			NRCS Prime	**704.0**							

Notes:

* Map units in bold are listed by NRCS as prime farmland if irrigated, yet with LCC >2 this classification is not consistent with Coastal Act/County definition

Prime	Non Prime
Worswick	Occidental
Weott	Wigi
Swainslough	Samoa
Loleta	Swainslough-Occidental

Table 3.2-3 Soil Salinity and Fertility Analysis

Pasture	Map Unit	Prime (NRCS)[5]	Vegetation (Field Observation)	Sample Description	Sample ID[3]	Sodium Adsorption Ratio (SAR)	Exchangeable Sodium Percentage (ESP)	pH	Electrical Conductivity (EC)[4]	Salinity Classification[1]	Organic Matter	Nitrogen
Western 40	**Worswick**	*	*Lolium*	representative	T14-0	12.4	14.6	6.6	3.0	Non-saline	M	L
Western 40	Occidental		*Festuca perennis*		CS2	37.0	34.8	7.6	18.0	Saline-sodic	L	VL
Williams	**Loleta**	*	*Lolium**	seasonal wet pasture	G5-0	1.7	1.2	5.5	0.4	Non-saline	VH	VL
Williams	**Loleta**	*	*Lolium**	upland pasture	G6-0	0.7	<0.1	5.3	0.2	Non-saline	H	L
Quonset	**Loleta**	*	*Agrostis / Argentia**	upland pasture	G7-0	0.7	<0.1	5	0.3	Non-saline	VH	L
100 acre	**Weott**	*	*Agrostis / Argentia*	representative	T6-0	6.7	7.9	5.8	3.3	Non-saline	H	VL
100 acre	**Weott**	*	*Argentia / Agrostis*	representative	T7-0	7.1	8.4	5.8	1.9	Non-saline	VH	VL
100 acre	**Weott**	*	*Argentia / Agrostis**	monitoring well location	B1-0[2]	12.5	14.7	6.2	7.2	Saline	M	VL
W Pasture	**Weott**	*	Barren / Invasive	outwash	T8-0	1.4	0.9	5.9	3.0	Non-saline	L	VL
W Pasture	Swainsslough-Occidental		*Argentia / Agrostis**	monitoring well location	B2-0[2]	5.6	6.5	5.9	4.2	Saline	L	VL
W Pasture	Swainsslough-Occidental		*Agrostis / Distichlis**	monitoring well location	B3-0[2]	13	15.2	6	5.6	Saline-sodic	VH	VL
W Pasture	Swainsslough-Occidental		*Agrostis / Distichlis**	monitoring well location	B4-0[2]	16.3	18.5	5.7	6.7	Saline-sodic	H	VH
W Pasture	Swainsslough-Occidental		Sparse / *Eleochaeris / Juncus / Rumex / Argentia*	outwash	T11-0	4.2	4.7	6.2	4.3	Saline	L	L
W Pasture	Swainsslough-Occidental		*Agrostis*	drier SW portion	T12-0	6.5	7.6	5.8	5.3	Saline	M	VL
W Pasture	Occidental		*Agrostis / Argentia*	paired across from B2	T15-0	1.8	1.3	5.6	1.0	Non-saline	H	VL
W Pasture	Occidental		*Distichlis / Agrostis*	mowed	T16-0	7.7	9.2	6.1	2.6	Non-saline	M	VH
Access Route	Occidental		*Agrostis*	W of road, natural topo	T19-0	12.2	14.4	5.2	7.9	Saline	VH	VL
Duck Club	Swainsslough-Occidental		*Distichlis / Agrostis*	does not appear grazed	T9-0	10	11.8	5.8	3.7	Non-saline	L	VL
Duck Club	Swainsslough-Occidental		*Agrostis*	grazed	T10-0	6.1	7.2	5.2	3.0	Non-saline	H	VL
Duck Club	Swainsslough-Occidental		Mixed / *Eleocharis**	representative, N area	G4-0	20	22	5.4	5.2	Saline-sodic	VH	VL
North Levee	Occidental		*Sarcocornia*	wet marsh	G1-0	26.4	27.3	6.4	10.4	Saline-sodic	VH	VL
North Levee	Occidental		*Agrostis*	representative	T2-0	12.1	14.2	5.5	2.3	Non-saline	VH	L
70 acre	Occidental		*Agrostis*	drier, N area	T3-0	17	19.3	5.4	5.2	Saline-sodic	VH	VL
70 acre	Occidental		*Agrostis*	representative	T4-0	22.7	24.3	5.4	6.3	Saline-sodic	VH	VL
70 acre	Occidental		sparse / *Sarcocorni*	dry micro channel	G2-0	31.5	31.1	6.1	11.5	Saline-sodic	H	L
70 acre	Occidental		*Sarcocornia / Distichlis*	representative	T5-0	21.1	23	5.6	4.9	Saline-sodic	M	VL
North Barn	Samoa-clambeach		*Agrostis / Juncus*	foot of dune	G3-0	4.2	4.7	5.1	11.5	Saline	L	L
Pasture 1	Occidental		*Sarcocornia pacifica*	salt marsh	CS1	29.5	29.7	5.5	22.0	Saline-sodic	VH	L
Pasture 1	Occidental		*Sarcocornia pacifica*	salt marsh	CS4	23.0	24.6	5.9	14.6	Saline-sodic	M	VL
Pasture 1	Occidental		*Sarcocornia pacifica*	salt marsh	SC3	18.6	20.8	5.2	8.6	Saline-sodic	M	VL
Pasture 2	**Worswick**	*	Managed Pasture	managed pasture	RC1	1.1	0.3	6.2	0.5	Non-saline	L	L
Pasture 2	**Worswick**	*	Upland Ruderal	upland ruderal	RC2	0.9	<0.1	5.6	0.4	Non-saline	L	L
Pasture 2	**Loleta**	*	Managed Pasture	managed pasture	SC1	1.9	1.5	5.2	0.6	Non-saline	L	L
Pasture 2	**Weott**	*	Managed Pasture	managed pasture	SC2	10.2	12.2	7.1	1.9	Non-saline	L	VL
None (Outboard Marsh)	Wigi		*Sarcocornia / Spartina / Distichlis*	representative, wet marsh	G8-0	32.7	31.9	5.9	15.4	Saline-sodic	M	VL
None (Not Grazed)	Occidental		*Festuca perennis*		CS3	25.1	26.4	6.1	7.4	Saline-sodic	M	VL

Notes: Code to rating: Very Low (VL), Low (L), Medium (M), High (H), and Very High (VH)

1. Salinity Classification established per Table 3.17 "Summary of Salt-Affected Soil Classification" (Soil Fertility and Fertilizers - 6th Edition. Havlin,Beaton, Tisdale, and Nelson, 1999)
2. B-# Samples collected by LACO during monitoring well installation
3. Lab sample ID denotes beginning sample depth after hyphen. Samples are composite of 6" of soil column.
4. EC reporting units: 1 dS/m = 1mmho/cm
5. Prime if irrigated

* Vegetation type listed based on habitat map (~1 acre minimum map unit), and not based on site specific observation

Also included in Table 3.2-3 are the pastures/locations of soil samples, dominant vegetation type, and soil map units. This collation of information helps document that the soil sampling approach captured the diversity of conditions and pasture areas at the site, and correlates variations in salinity spatially across the different soil map units at the site, vegetation types, and within the various pastures.

Soil analytical results from this phase of sampling generally align with several of the soil map units, but even more so with topography and vegetation characteristics. As was expected, higher elevation areas afford better agricultural use/productivity (according to production records, stocking rate records and land lessee interviews). Where Arlynda, Loleta, Weott, and Worswick series are mapped within Quonset, Williams, and Western 40 pastures, and Russ pastures to the south, soil results from these areas generally are classified as less saline and quite productive. Conversely, the lower elevation areas susceptible to inundation, particularly those including Occidental soils, are either fully converted to non-agricultural use (Angels Camp), or are indicated by site managers or lessees as being limited for grazing to only portions of the year on a semi-annual basis due to soil moisture, salinity, access issues, and vegetation species composition. Many of the soil samples from these latter locations exhibited saline or saline-sodic conditions that result in low productivity.

Vegetation Mapping

Described in greater detail below, and fundamental to this analysis, the vegetation of the Project area was mapped in great detail in 2013 and again in 2015, and the results are summarized in the Vegetation Detail Map (Figure 3.2-4) and the accompanying Pasture Vegetation Detail Table (Table 3.2-1).

The Vegetation Detail Map (Figure 3.2-4) depicts vegetation alliances throughout the Project site for each designated pasture area. Additional detail for the site was collected and reported under a separate cover (GHD 2013).[3] The Vegetation Detail Map illustrates additional micro areas where during the soil sampling and agricultural data collection efforts, small areas of low productivity (salt grass and pickleweed) were noted and recorded as center points in circular polygons that approximated these micro areas (not captured on the overall site habitat map due to minimum mapping unit). The table that accompanies this figure (Table 3.2-1) quantifies habitat types within each grazed pasture, as well as the ungrazed portion of the site areas. From this table, based on vegetation type, areas of lower productivity vegetation types such as salt grass (*Distichlis spicata*), pickleweed (*Sarcocornia pacifica*), palustrine emergent wetland vegetation, and bare ground are identified separately in the table. Determination of productivity of areas based on dominant vegetation community present is discussed below.

Based upon the vegetation communities and soils mapped at the Project site, the following influences, trends and assumptions are noted regarding existing/anticipated agricultural productivity:

<u>Salt influence:</u> Areas with dominant brackish species composition appear to have low to moderate productivity from an agricultural/grazing perspective due to species composition and/or limiting soil conditions for vegetative growth of pasture species. This would include vegetation alliances such as the *Agrostis stolonifera/Distichilis spicata* complex, visible in Figure 3.2-4

[3] Pasture areas on Russ property south of the EREP are divided somewhat at random and with the agreement of the landowner based upon the system of rotational grazing techniques utilized there. Russ property is also easily organized based upon soil types; these include Occidental soil in Angels Camp, and Worswick, Weott, Arlynda and Loleta soils elsewhere.

Wetness: Seasonal elevated soil moisture (saturation) and above ground surface ponding limit accessibility of equipment, diminish implementation of management techniques such as ploughing and seeding, cause reduction in plant growth when saturated or flooded, modify plant species composition and presence of forage species, limit time of cattle grazing on some portions of the site for significant parts of the year and limit use of some pastures to only seasonal productivity once areas dry out and/or access is possible. Areas mapped with Vegetation Alliances falling within the "Freshwater Emergent Herbaceous" category (e.g. *Juncus*, *Eleocharis*, *Rumex*) appear to have low and/or unpredictable productivity for a portion of the year, and moderate productivity (depending on species composition) for several months of the year once portions of the site dry.

Some vegetation Alliances within the "Pasture and Agricultural Wetlands" category are likely limited for a portion of the year due to soil moisture and/or soil moisture influence on species composition. Vegetation alliances that include as a dominant component bentgrass *(Agrostis stolonifera*), perennial ryegrass (*Festuca perenne*), and ruderal vegetation could support moderate to high productivity due to species composition for at least a portion of the year depending on duration and extent of flooding.

Soil texture: Much of the EREP is Occidental or Occidental-Wigi complex soil type. These are fine, silty soils hosting multiple vegetation alliances with low to moderate productivity. It appears that the southern portions of the Project area grow increasingly loamy and more fertile. Areas mapped with dune species composition, and other areas of sand dominated substrate, are lacking in nutrients, water retention capability and in general " droughty" having low to no productivity due to difficulty in supporting pasture species.

Overstory: There are limited areas mapped with shrub and tree dominated species, which may offer limited agricultural productivity due to reductions of pasture species. Impact is largely dependent upon density of growth and efficiency of solar radiation capture by pasture species.

Other Conditions: Some areas are determined to be non-productive from an agricultural perspective, including bare ground, development features such as buildings, ditches, roads, open water, sloughs, and mudflats. These areas have limited agricultural productivity due to inaccessibility to cattle and/or absence of pasture species. Many of these features also limit accessibility for haying equipment. The possible exception is levees which can support some limited pasture species on the edges and side slopes and therefore may have low to moderate productivity for grazing, though no viability for haying.

Historical Context

The entire Eel River Estuary including the Project area was extensively altered over the last 150 years in order to expand agricultural production in the region. Nineteenth and early 20th century reclamation efforts converted the Project area from salt marsh to productive pastures. Levees, tide gates, dikes, and berms were installed to reduce tide-water volume, to reclaim wetlands for agricultural conversion, and to better manage high water events. The network of levees and tide gates in the Eel River estuary blocked the ebb and flow of the ocean tides and reduced the volume of water that is exchanged during a tidal cycle (tidal prism). In 1870, the tidal area of the Eel River Delta was estimated to be 6,525 acres. Within a few decades, possibly within 10 years, that had been reduced by hundreds of acres on the EREP alone. By 1970, the estuary, inclusive of sloughs and side channels, was reduced by thousands of acres to 2,200 acres, or 3.4 square miles (CDFG 1997). In 1989, the Soil Conservation Service estimated that the Eel River Estuary was 40 percent of its original size. A significant portion of this reclamation occurred in the Project area, specifically on the EREP. The accompanying 60 percent reduction in overall tidal prism in the Eel River Delta dramatically influenced the landscape of the area.

The Centerville Slough/Salt River watershed was a focal point of the reclamation and associated changes that accelerated in the late 19th century. The Seaside and Occidental Reclamation Districts were formed by James T. Robarts and Joseph Russ, his father-in-law. Robarts, a talented and ambitious engineer, built half a dozen bridges totalling 550' of solid bridges set on pilings in order to cross the various sloughs and link the tracts of land in the area together. This work was completed by 1889. Anecdotally, the primary access route to the Project area at this time was along the dunes. As the creamery at nearby Occidental Ranch flourished, the access road to the ranch was changed in 1897 to lead straight from Salt River along Port Kenyon Road to the creamery, and a bridge across Mill Slough was constructed. All of this development was central to the expansion and agricultural development of the Occidental Ranch, formerly comprising the Project area and much of what is now the O'Rourke Foundation property (formerly Bertha Russ Lytel Foundation property).[4]

Amongst Robarts's many bridges, tidegates and other control structures, he and Russ constructed an historic and controversial tidegate on Cut-off Slough, subject of a 1903 California Supreme Court case brought by, among others, Robarts's brother Robert. Despite Russ's defeat at the Supreme Court level, the tidegate remained, and a more durable structure was built in 1916 by A. Rusk, a resident of Occidental Ranch from 1919-1951, and crew. This tidegate, known as the Cut-off Slough Tidegate, or sometimes as the "Occidental Tidegate," had deteriorated considerably by the mid-20th century, and was replaced on the Connick Ranch by a consortium of adjacent property owners in 1979. It has deteriorated since, exhibiting some leaking and structural decline.

The frequent and significant investments in infrastructure, as well as the observation of one resident of Occidental ranch, demonstrate that the Eel River Delta has never been an easy place to settle, nor to farm; agricultural resources have always been subject to the whims of nature.

"Flooding was always a problem at Occidental. Drainage tiles were put in some of the lowest fields. A floodgate was built in Centerville Slough soon after we moved there, and dikes were constructed along the bank of the slough… In 1918 and 1919 a floating dredger was brought in and this dredger worked its way around the ranch, biting out a drainage canal where it floated, and building up a high bank at the same time…." (Iola Young in "Along the Banks of Salt River").

In addition, a levee from the tidegate to the beach was built in 1956. This dike was rebuilt in 1965, and the dike leading to the Durham Dairy, near Fern Cottage, was also completely repaired.[5]

Due to the placement of various control structures within the Salt River/Centerville Slough complex, tidal influence was significantly diminished as early as the 1870s, but accelerated towards the end of the 19th century. With the replacement of the Cut-off Slough tidegate in 1916, tidal exchange south of the tidegate was almost completely eliminated, and any navigation of Centerville Slough and the slough channels to the south was terminated. This series of actions promoted and accelerated deposition of material within and along the historic Centerville Slough network, just as

[4] In 1941 The Russ-Connick Co. partnership took over the greater portion of the Occidental Ranch and it became known as the Connick Ranch. Harris Russ Connick assumed management of the ranch in 1942. In 1945, Harris Russ Connick received the northern portion of what is now the Project area. Under Harris Russ Connick, the ranch supported three operations—a cow-calf herd, feeder lambs, and a short-run potato business.

[5] The continuing challenges associated with farming and ranching in the Eel River Delta are echoed in the Eel River Area Plan, the Local Coastal Program for this area (ERAP C 4 – P 4).

it had in the Salt River slough network.[6] This trend facilitated reclamation of former tidelands, but created drainage problems through the reduction of channels for overland flow.

Exacerbating drainage challenges, the tributaries to the Centerville Slough complex and Salt River contributed large quantities of sediment, associated with road building, timber harvest, grazing practices, unstable geology, highly erodible soils and high rainfall levels. Historically, this sediment load from the Wildcat Hills was effectively managed to maximize the agricultural potential of the area. In recent decades this management entailed establishment of “cells” approximately 40 acres in size by constructing small levees of 1-2’ in height, and then directing Russ Creek flow into the cell, where sediment could decant. This practice of actively extending the alluvial fan appears to have been practiced throughout the Project area, and continued on the Connick Ranch until transfer of the property to TWC in 2008. The effects are clearly visible on the Elevation Map of the Project area (Figure 3.2-6), which also depicts the avulsion directions.

The direct manipulation of the alluvial fan of Russ Creek had three major effects. First, Russ Creek was entirely channelized, manipulated, straightened, and altered from its historic configuration. Second, Centerville Slough, once the primary extension of the Salt River was entirely filled, leaving only a remnant swale where the historic channel once existed. The Centerville Slough channel, once approximately 300 feet wide and 21-feet deep is non-existent, and probably contains at least one million cubic yards of aggraded sediment. Third, and most important to the Project and to drainage patterns in the area today, an area extending east to west along the boundary of EREP and RR&T within the Project area was elevated high enough to bifurcate the Russ Creek drainage.

By directly manipulating the flow and sediment load of Russ Creek in a controlled fashion, pasture managers successfully and visibly elevated pastures many feet over a broad area. The approximate area of this alluvial fan manipulation is detectable through elevation changes and soil chemistry. The altered area appears to be approximately 900 acres in size with an average depth of three feet, but relative elevation increases ten feet in places. This suggests that an originally anthropomorphically established alluvial fan avulsion area has been extensively augmented artificially for a total volume of approximately 3.6 million cubic yards of material. From an agricultural perspective, this approach was a huge success; by steadily extending the alluvial fan northwards with soil eroding from the Wildcat Hills, land managers decreased susceptibility to flooding by raising pasture elevation, decreased the risk of storm damage to adjacent seeded pastures by containing and decanting high flows within cells, and harnessed natural forces for the benefit of agricultural production in a challenging environment. However, since not all parcels participated uniformly in this management strategy, this approach failed to provide equal benefit to the entire area.

Certain parcels south and east of the EREP that did not benefit from the pasture raising approach are now at significantly lower elevation than the southern portion of the EREP and parts of RR&T property. This condition presents substantial flood routing challenges. These areas include a significant low-lying part of the RR&T property south of the EREP, most of the ORF property and the northerly portion of the EREP where directed alluvial deposits were not possible. The current elevations pose a significant challenge for land managers seeking to route the flows of Russ Creek, Shaw Creek and Creamery Ditch north towards the Eel River. RR&T now find this trouble compounded by more frequent wave overwash from the Pacific Ocean, associated deposition of

[6] Prior to the completion of Phase I of the Salt River Ecosystem Restoration Project (SRERP) in October 2013, tidal influence within the Salt River terminated at river mile 3.5, the approximate confluence of Reas Creek, and channel flow became intermittent at river mile 4.8, slightly above the Dillon Road Bridge. Tidal influence now extends fully to river mile 5.0, one half mile above the Dillon Road Bridge, and the terminus of the 2015 construction season of the SRERP (Svehla pers.comm.)

sand into key drainage components such as the Western Drainage Ditch, levee deterioration and ultimately sea level rise. In an increasingly challenging environment, those parcels are entirely dependent on flow from Russ Creek, Shaw Creek, Creamery Ditch and on occasion the Pacific Ocean being directed through the EREP. Traditionally, this has been accomplished via routine though unpermitted maintenance of the Western Drainage Ditch. More recently, emergency permits have been issued for that routine maintenance.

Similarly, the northern portions of the ORF property are at elevations ranging from 15 to 18 feet, while the majority of the property ranges from 1-4 feet elevation, rendering most of the property highly susceptible to flooding and bathtub-like ponding under existing conditions, particularly when storm events combine with high water surface elevations in the Eel River Delta.

In summary, the historic management of sediment and drainage, successful though it was for a time, depended upon four things: unified family or business ownership; total concurrence and mutual benefit of sediment management and drainage features, static environmental conditions created by both independent and outside investment and no environmental or regulatory oversight of land management. None of these preconditions exists at this time. The agricultural operations enabled by the reclamation of the area, construction of levees and maintenance of tidegates and Russ Creek created extensive and long-lived benefits but present new challenges for land managers that the Project proponents seek to address.

Existing Agricultural Uses – Eel River Estuary Preserve

The Connick Ranch was acquired by The Wildlands Conservancy (TWC) in 2008 and re-named the Eel River Estuary Preserve (EREP). At the time of acquisition, the property had been leased by the former owner to the Russ Cattle and Timber Company for many decades. TWC inherited this lease and continued it from 2008 to 2012. That lease was mutually terminated in 2012, and a new lease was let with Robert and Tim Miranda. TWC's goal is to manage the property for outdoor education, agricultural production and habitat enhancement; TWC defers extensively to their lessee for input on achieving the full economic potential of the property, consistent with habitat protection, enhancement and outdoor education goals.

The EREP is enrolled in a Williamson Act contract entitled "Wildlands Conservancy Agricultural Preserve No. 09-05". Nine hundred fifty-two (952) acres are enrolled in a Class C Agricultural Preserve. Six hundred forty-eight (648) acres are identified in that contract as being "Areas In Grazing" (Figure 3.2-7). Grazing, harvest of hay and silage are the primary agricultural uses on the property. TWC also conducts educational outreach that emphasizes ecological restoration and agriculture as practiced in the Coastal Zone.

The agricultural portion of the EREP is divided into 11 pastures totalling approximately 745 acres of the 1,100 acre EREP property[7] These pastures are depicted with corresponding estimated productivity levels on Figure 3.2-8. Proposed productivity levels are depicted on the accompanying Figure 3.2-9, and discussed in detail, below. Currently, 42 acres are comprised of various structures, fencing, control structures, other infrastructure necessary for ongoing agricultural operations, or other features such as mudflats that do not support agricultural use. Overall, approximately 330 acres of the EREP are deemed unsuitable for agricultural production because of vegetation type, landforms, standing water, drainage problems, or other issues that prevent agricultural use. As described in site conditions, above, these areas are outlined in Table 3.2-1.

[7] There is a slight discrepancy between the acreage enrolled under the Williamson Act, and the actual acreage in pasture, likely due to the ability to graze some non-enrolled acreage.

Overall, most pastures in the Project footprint offer fair to excellent forage for livestock. As with the rest of the Ferndale area, the ample rainfall and mild climate create cost-effective pastureland with good growth rates of grass and little need for heat or air-conditioning for the cows and goats (HCRCD 2007). Unlike other areas of the Ferndale Bottom where dairies predominate, there is less irrigation, somewhat poorer soils, higher soil salinity rates, lower fertility, and other factors that reduce overall productivity levels in the Project area below the regional average. Salinity and conductivity levels presented in Table 3.2-3 validate pasture productivity levels discussed below. A USDA-NRCS table interpreting electrical conductivity helps explain the status of Project pastures.

Image 3.2-1 Electrical Conductivity

(dS/m)	Salt Rank	Interpretation
0-2	Low	Very little injury to plants
2-4	Moderate	Sensitive plants may suffer
4-8	High	Non-salt tolerant plants will suffer
8-16	Excessive	Only salt-tolerant vegetation will grow
16+	Very Excessive	Very few plants will grow

For example, the Williams Pasture is the most productive pasture on the EREP. Its EC is 0.4. The 70 acre Pasture, a less productive area, ranges from 4.9 to 11.5, rivalled only by the ungrazed areas of the EREP, which are 15.4.

TWC has reversed much of the deferred maintenance of the existing agricultural acquired in 2008, initiating agricultural improvements to the property. First, the termite-infested and dry-rot degraded Potato Barn was repaired, inclusive of the addition of a ranch office. Second, in an attempt to diminish liability risk under the terms of a drainage easement to surrounding property owners, and to ensure durability and accessibility of key drainage features of the property, TWC replaced the collapsed Cut-off Slough Tidegate culvert, replaced the badly eroded and perched Russ Creek Bridge and relocated the north-south road leading to the Cut-off Slough tidegates. Through management and investment by TWC and its lessees, the EREP's agricultural productivity is improving.

Pasture improvements have also been implemented in the Project area. Some of the early challenges the Mirandas faced as lessees (e.g. low productivity in western pasture due to predominance of pacific silverweed and saltgrass) are being remediated by various measures. For instance, haying and silage began in 2013 for the first time in many years. In some areas, such as the Western Pasture, this new approach is improving pasture by diminishing the predominance of *Juncus*, and other less desirable forage species. Access throughout the property, previously a significant challenge, has been improved via more predictable and improved access corridors that feature improved and stable bridges, rocked road and strong and functional fencing and gates. Among other benefits, construction of the bridges has enabled haying of the Western Pasture and the 40 acre Pasture for the first time in 2013, thereby increasing the agricultural productivity of part of the preserve by up to one ton of hay per acre per year.

The Mirandas emphasize a desire to improve productivity where feasible with a prudent level of investment of labor and capital. For instance, much of the Western Pasture (166 acres) was producing about 0-1 tons/acre of forage due to poor vegetation community (sedges, salt grass, pacific silverweed, potentila, etc.), so they are mowing intensively in an effort to increase competition for more desirable forage species. Although they do not expect to achieve the high

level of production at the Williams or Quonset Hut Pasture (48 acres), they have experienced improvement. Similarly, by fully tilling the avulsion area as soon as possible, potentially in combination with modest irrigation improvements, they expect to increase productivity in advance of Project implementation, even to productivity levels experienced on the Western 40 and Williams pastures, the highest on the EREP. Discussions regarding a more predictable management of the Hunting Club/duck pond area have the potential to promote more environmentally responsible pond management while increasing available pasture and improving the productivity of pastures near the ponds that currently suffer from historic duck club management approaches.

The EREP also offers significant promise for niche, high value agriculture in the Coastal Zone, particularly in areas subject to grazing limitations as part of the enhancement Project. For instance, as of June 2013, TWC authorized a seed collection agreement with Pacific Coast Seed (PCS) that enables PCS to harvest rare native plant seeds on site for habitat enhancement efforts in the area. The final product is a high value locally sourced material that contributes a vital product to local restoration practitioners. Many of the seeds sourced on EREP were utilized for the Riverside Ranch phase of the Salt River Ecosystem Restoration Project, a phase that was completed in October 2013.

Existing Agricultural Uses - Russ Family Properties

Lands to the south of the EREP owned by Russ Ranch and Timber, LLC and Jack and Linda Russ are managed by Jay Russ. Mr. Russ, a fifth generation livestock operator there, has grazed that area actively for years raising organic grass-fed beef cattle marketed under the brand name Humboldt Grassfed Beef. He largely adheres to a system of rapidly rotational flash grazing on numerous small pastures promulgated by Alan Savory.

The RR&T parcels are also enrolled in a Williamson Act contract entitled “Centerville Ranch Agricultural Preserve No. 87-28”, originally recorded on February 27, 1987, and amended in 2008 (Figure 3.2-7.) It originally included eight parcels, filed under APN 100-142-010. A lot line adjustment was completed in 2008 and 45 acres were added to the contract. APN 100-142-010 was part of the lot line adjustment, and part of the lands added to the contract. After completion of the lot line adjustment, a new APN (100-142-021) was created for the newly adjusted 100-142-010. Parcels now included in that contract are: APNs 100-142-008, 100-142-009, 100-142-011,100-142-021, 100-143-002, 100-143-003, 100-143-004, 101-011-005 and 101-011-014. Unlike the Williamson Act contract for the EREP, the RR&T contract does not specify which portions of the property under contract are “areas in grazing.”

The pasture sizes and configurations change for rotational grazing management purposes, so for the purposes of this analysis, they are described in terms of two areas organized by soil type and vegetation characteristics (see the habitat figures in the biology chapter). Of the approximately 600 acres to the south of the EREP, approximately 410 acres are intensively managed pasture, and approximately 190 acres are classified as non-agricultural due primarily to the flooding and wave overwash at Angels Camp.

RR&T parcels are readily divided into two “pasture” areas, based on soil type and condition. These are depicted on Figure 3.2-8. Pasture 1, the Angels Camp area, is exclusively Occidental soil. This soil type can be productive, but much of Pasture 1 has converted to salt marsh due to wave overwash and poor drainage. The Project related activities proposed to occur on Pasture 1 include dune enhancement, channel restoration and setback berm construction. Pasture 2 is comprised of Worswick, Weott, Arlynda and Loleta soils. Activities proposed for Pasture 2 where prime and highly productive Arlynda and Loleta soils predominate, are limited to establishment of sediment management areas, Shaw Creek and Creamery Ditch alignments and other minor activities.

With the exception of most of Pasture 1, RR&T land on is highly productive, certainly prime, and most similar in vegetation and productivity to the Western 40 or Quonset pastures on EREP. The only exception to this productivity and prime status on Pasture 2 is several low lying areas that are subject to ponding and resulting low productivity. Another insignificant exception is certain areas along Russ Creek that approximate the avulsion area with respect to unpredictable production levels.

Agricultural Challenges

As described under "historical context," above, the Eel River Delta is a challenging environment for farming and ranching, though its climate and conditions render it worth the risk. However, the challenges and risks are mounting. The greatest challenges to the area are highlighted by the USDA NRCS in their Climate Change Vulnerability Assessment and Adaptation Plan – 2014. This report identifies the following risks relevant to the Project:

Key Climate Change Predictions

- Coastal storms are expected to increasingly contain damaging winds leading to greater extreme wave heights (storm surges) and coastal damage.
- Sea Levels are projected to rise 6-8 inches over the next 40 years.

Resulting Impacts:

- Increasing salination of near-coastal waters.
- Increased flooding frequency of marginal lands.
- Changes in plant adaptability in specific locations due to environmental shifts.
- Increased competition from weeds/invasive plants.
- Increased soil health challenges due to potential increased erosion and changes in soil chemical and biological processes.

In sum, agricultural operations face risks increasingly compounded by sea level rise, saltwater intrusion, channel aggradation, increasing flood risk and decreasing drainage capacity of the area. Accordingly, owners and lessees in the Project area have consistently communicated two priorities and concerns for future operations: 1) salt water incursion and Sea level rise adaptation planning, and; 2) drainage improvements across the Project area. Since existing conditions already pose serious challenges to agricultural operations in the Project area, climate change and sea level rise projections dictate that the status quo at the Project area is not a desirable trajectory for the property owners, their lessees or surrounding property owners who depend upon drainage through the EREP.

Wave Overwash and Inundation

Wave overwash, inundation and saltwater intrusion are by far the most immediate and pressing problems facing the southern portion of the Project area, particularly RR&T properties. Due to the Project area's proximity to Centerville Beach, and the unstable nature of the dunes there, salt water incursion into the Project area, and its need to drain, is a serious concern for all landowners and lessees in the area. Dune systems are inherently unstable, and wave overwash/breach events have been a feature of the landscape for a long time, but with the elimination of a salt marsh behind the dunes, and the advent of livestock grazing up to the back of the dunes, protecting agricultural land from those events is increasingly challenging and of increasing urgency.

Aerial evidence of dune overwash dates back to at least 1963, and such events undoubtedly always occurred, but the frequency appears to have increased in the last 10 years, as shown in Image 3.2-2, below. So, too, has the adverse impact on agricultural land (Figure 3.2-10). Since 1963 there have been at least nine dune overwash events in the Project area. These events range from 4 acres to 81 acres in 2012. The size of affected area appears to be increasing over time.

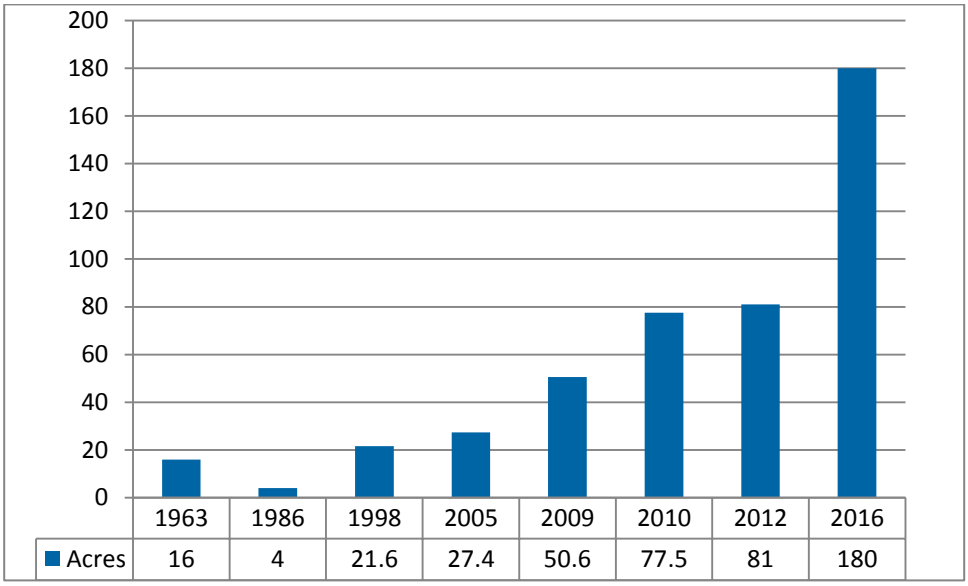

Image 3.2-2 Inundation Acreage by Year Resulting from Wave Overwash

The threat that wave overwash presents to agricultural practices is dire, although, its importance increases or diminishes in importance relative to how rapidly saline waters can drain from the property: the faster the water drains, the less adverse the impact on pasture and freshwater dependent vegetation there would be, and the less likelihood that soils would become saline/sodic. Accordingly, higher volumes of water washing over pose the greatest threat due to their inability to drain rapidly.

Dune stability, and its inherent ability to protect pastures to the east, appears to be declining rapidly in the Project area. Breaches appear to be occurring with greater frequency and severity. The most severe example of this trend is the 2009 breach at Centerville Beach County Park, which has extended in width from less than 100 feet to its current width approaching the southern boundary of the EREP. This broadening, visible on aerial photos, occurred in just two years, and converted in short order approximately 200 acres of prime agricultural land on RR&T to salt marsh. Although NRCS subsequently purchased a WRP easement over the marsh, the effect was still economically devastating. Storm surges in 2015 exacerbated the situation, causing the Western Drainage Ditch to fill with sand, drainage to slow, and necessitating the landowners to seek emergency maintenance permits on a routine basis. As mentioned above, this approach is procedurally and physically challenging. Moreover, the routine “emergency maintenance activities” appear to be entirely insufficient to meet the challenge of matching drainage capacity with inflow, flooding and ponding.

Another breach on EREP that began in 2005, and continued through 2010, is of concern to TWC and its lessees. The dune erosion has slowed at EREP due to restrictions on OHV use as well as revegetation efforts, but it continues steadily. TWC is concerned about this trend, particularly in view of the modelling available with respect to climate change and sea-level rise as predicted for

the coming years. Dune management is a high priority for TWC and RR&T for study and discussion, particularly in relation to the agricultural future of the Project area.

The dune exterior appears to be eroding and developing steep slopes less capable of withstanding heavy surf. Reasons for this are complex, and described in detail in the Hydrology and Water Quality section of this EIR (Section 3.9) and the hydrology report prepared by Kamman Hydrology and Engineering (Kamman 2015), but absent dune stabilization and planned retreat planning for the future, future agricultural productivity in the Project area appears to be threatened. If one factors in Sea Level Rise at recently revised rates, the need for prompt action to protect agricultural property in the Project area is urgent.

Drainage

In the immediate term, drainage is the second most pressing concern with respect to maintaining and improving agricultural productivity in the Project area. Drainage for the entire Project area is dependent upon a north-south channel, a functional tidegate and sufficient elevation. At present, the Western Drainage Ditch is serving in inadequate fashion for the north-south drainage, the tidegate is in a state of deferred maintenance and elevation of the landscape is unable to keep pace with sea level rise.

It was very clear from interviews and review of the history of the avulsion area that predictable management of Russ Creek and associated drainages through the EREP is vital for improving agricultural productivity in the entire Project area. The current avulsion area in the 100 acre Pasture is a prime example of an area where pasture could be profoundly and predictably improved, provided that predictable drainage of Russ Creek with its high sediment loads is restored, and procedurally feasible sediment management practices such as those envisioned for the Adaptive Management Plan (AMP) are implemented.

Russ Creek Avulsion Area

That portion of the Project area where Russ Creek periodically avulses out of any definite channel into the Duck Club, 100 acre and Western Pastures is known as the Russ Creek Avulsion Area (RCAA). The RCAA frequently and currently possesses little productivity due to unpredictable sediment deposition, water sheet flow, ponding, and vegetation response to avulsionary disturbance. At best, and for purposes of a highly conservative approach to this analysis, the avulsion area is assumed to possess a dry matter productivity level of 225 pounds/acre/month. Its average size is assumed to be 115 acres, the average of the highest and lowest avulsion sizes in the context of avulsion cells that are not anthropogenically established.

Prolonged flooding, inundation, sediment deposition and resulting shifts in vegetation communities in the avulsion area have resulted in substantial agricultural and ecological losses for the landowner as well as their lessees. With an average of 115 acres out of production each year due to the avulsion, and assuming a minimum production capacity loss of 500 lbs/acre/month for nine months of the year, annual losses in the avulsion area based on surrounding pasture production rates are substantial. With hay costs estimated at $150/ton, this loss of forage equates to an approximate annual loss of $38,773. Even if this loss is overstated based on seasonality of hay production, this valuation correlates well with annual pasture lease rates in the area, which typically occur on a cash basis in the range of $225-$300/acre/year for certified organic pasture. At $300/acre, the rental value of the 115 acre avulsion area, if well managed, would yield approximately $34,500 on the open market due to its ability to support approximately 100 AUMs under well-managed conditions.

At the Russ Creek avulsion, 25 acres out of 80-150 acres retain some level of productivity. The rest of the pasture is either bare, suffers from imperfect drainage, or is dominated by non-productive invasive species, with little grass evident (Figure 3.2-4, Table 3.2-1, Figure 3.2-8). One of the primary reasons for this low productivity in the area is the combination of a lack of a defined channel to route floodwater, the unpredictable nature of avulsive events, and the ponding of water that prevents timely preparation for agricultural activities.

3.2.2 Regulatory Framework

Federal

Federal Farmland Protection Policies

Loss of farmland is an important concern that is captured by the development of federal, state and local policies calling for protection of Prime, Unique or Statewide Important Farmland. Under the Federal Farmland Protection Policy Act (FPPA), projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by, or with the assistance of, a federal agency. As the U.S. Department of Agriculture's Farmland and Conversion Impact Rating form advises, "The purpose of the rating process is to ensure that the most valuable and viable farmlands are protected from development projects sponsored by the Federal Government...Accordingly, a site with a large quantity of non-urban land surrounding it will receive a greater number of points for protection from development." The form advises that the "LESA system is used as a tool to help assess the options for land use on an evaluation of productivity weighed against commitment to urban development" (USDA Farmland Conversion Impact Rating Form AD-1006 (10-83) at pages 4 and 7). For the proposed Project, as discussed below, it was determined that a Land Evaluation and Site Assessment (LESA) evaluation was not appropriate for this Project, as LESA evaluations are designed for residential and commercial development projects, not for ecological restoration projects that provide significant agricultural enhancement components

State

State Farmland Conservancy Program Act

State farmland protection policy is laid out in the California Farmland Conservancy Program Act (CFCPA), (Public Resources Code 10201-10202). The CFCPA recognizes the importance of the state's agricultural lands economically, culturally, and in terms of food security, as well as the threat to those lands from urban development. The agricultural conservation strategy established by the CFCPA involves appropriating state funds for the voluntary purchase of agricultural easements, together with restrictions on development through local planning and zoning.

The Important Farmland Inventory System initiated in 1975 by the U.S. Soil Conservation Service (now NRCS) classifies land based on 10 soil and climatic characteristics. The Department of Conservation (DOC) started a similar system of mapping and monitoring for California in 1980, known as the Farmland Mapping and Monitoring Program (FMMP). The NRCS soil delineations are depicted on Figure 3.2-5.

Under CEQA, and as was done as part of this EIR, the lead agency is required to evaluate agricultural resources in environmental analyses at least in part based on the FMMP. The state's system was designed to document how much agricultural land in California was being converted to non-agricultural land or transferred into Williamson Act contracts.

One limitation to State tracking of farmland trends in California is that the DOC administered California Important Farmland Finder (CIFF) hosts no data for Humboldt County. The DOC's

"Important Farmland in California, 2010" map does, however, list all of nearby Mendocino County, including coastal areas, as "grazing land," which in some ways is compatible with the premise that the Project area's highest and best agricultural use is as pasture and grazing land.

California Resources Agency Policies

California Department of Conservation

The DOC administers and supports a number of highly successful programs, including the Williamson Act, the California Farmland Conservancy Program, the Williamson Act Easement Exchange Program, and the FMMP. These programs are designed to preserve agricultural land and provide data on conversion of agricultural land to urban use. The DOC is responsible for approving Williamson Act Easement Exchange Program agreements.

Williamson Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, has been the State's primary agricultural land protection program since its enactment. It is a non-mandated state program administered by counties and cities to preserve agricultural land and discourage the premature conversion of agricultural land to urban uses. The act authorizes local governments and property owners to (voluntarily) enter into contracts to commit agricultural land to specified uses for 10 or more years. Once restricted, the land is valued for taxation based on its agricultural income rather than unrestricted market value, resulting in a lower tax rate for owners. In return, the owners guarantee that these properties remain under agricultural production for an initial 10-year period. The contract is renewed automatically unless the owner files a notice of nonrenewal, thereby maintaining a constant 10-year contract. Currently, approximately 70 percent of the state's prime agricultural land is protected under this act. Participation is on a voluntary basis by both landowners and local governments and is implemented through the establishment of agricultural preserves and the execution of Williamson Act contracts.

Termination of a Williamson Act contract through the nonrenewal process is the preferred method to remove the enforceable restriction of the contract. Cancellation is reserved for unusual, situations. In order to approve tentative cancellation, a board or council must make specific findings based on substantial evidence that a cancellation is consistent with the purposes of the act or in the public interest.

California Land Evaluation and Site Assessment (LESA) Model

Under California Public Resources Code Section 21095 (a), the California Resources Agency was required to develop optional methodology that considers the impacts on the environment from the conversion of agricultural land to non-agricultural uses. The DOC developed a LESA model in 1997 to evaluate agricultural conversions. This model was incorporated into the CEQA guidelines as an optional tool under the law. LESA was designed based on the federal LESA system and can be used to rank the relative importance of farmland and the potential significance of its conversion on a site-by-site basis. The California LESA model considers the following factors: land capability, Storie index soil rating system, water availability (drought and non-drought conditions), land uses within one-quarter mile, and "protected resource lands" (e.g., Williamson Act lands) surrounding the property. A score can be derived and used to determine if the conversion of a property would be significant under CEQA. The LESA model provides a broad range of scores and other factors that can be considered in determining impact significance.

However, an analysis conducted by the California Resources Agency found the LESA model poorly suited to evaluating impacts to agriculture from habitat projects because "wildlife habitat and other open space lands are specifically considered consistent with agricultural land uses in the model"

(Resources Agency 2006). A LESA analysis appears to be inadequate and inappropriate for use for the proposed Project. In addition, some of the factors required for the LESA evaluation, such as Storie index soil ratings, are simply not available for all of the soil types in the Project area.

Finally, for the purposes of this CEQA document, and as discussed below, conversions of more than 20 acres of prime agricultural land to other uses is considered significant. Therefore, the LESA model appears to be unnecessary and an unproductive means of analyzing Project impacts of the proposed Project.

California Coastal Act

The Project area is within the Coastal Zone. The California Coastal Act contains the Government Code policies that are relevant to the conversion of agricultural land in the Coastal Zone to natural resource uses. Unlike LESA, the Coastal Act and its expression in the Local Coastal Program appear to be highly suited to evaluating agricultural impacts of the proposed Project. The following Coastal Act sections are germane to this analysis:

> *Public Resources Code § 30241*
>
> *The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the area's agricultural economy and conflicts shall be minimized between agricultural and urban land uses through all of the following:*
>
> *d) By developing available lands not suitable for agriculture prior to the conversion of agricultural lands.*
>
> *f) By assuring that public service and facility expansions and non-agricultural development do not inhibit agricultural viability, either through increased assessment costs or degraded air and water quality.*
>
> *Public Resources Code § 30241.5*
>
> *Agricultural land; determination of viability of uses; economic feasibility evaluation*
>
> *(a) If the viability of existing agricultural uses is an issue pursuant to subdivision (b) of Section 30241 as to any local coastal program or amendment to any certified local coastal program submitted for review and approval under this division, the determination of "viability" shall include, but not be limited to, consideration of an economic feasibility evaluation containing at least both of the following elements:*
>
> *(1) An analysis of the gross revenue from the agricultural products grown in the area for the five years immediately preceding the date of the filing of a proposed local coastal program or an amendment to any local coastal program.*
>
> *(2) An analysis of the operational expenses, excluding the cost of land, associated with the production of the agricultural products grown in the area for the five years immediately preceding the date of the filing of a proposed local coastal program or an amendment to any local coastal program.*
>
> *For purposes of this subdivision, "area" means a geographic area of sufficient size to provide an accurate evaluation of the economic feasibility of agricultural uses for those lands included in the local coastal program or in the proposed amendment to a certified local coastal program.*
>
> *(b) The economic feasibility evaluation required by subdivision (a) shall be submitted to the commission, by the local government, as part of its submittal of a local coastal program or an*

amendment to any local coastal program. If the local government determines that it does not have the staff with the necessary expertise to conduct the economic feasibility evaluation, the evaluation may be conducted under agreement with the local government by a consultant selected jointly by local government and the executive director of the commission.

(2) An analysis of the operational expenses, excluding the cost of land, associated with the production of the agricultural products grown in the area for the five years immediately preceding the date of the filing of a proposed local coastal program or an amendment to any local coastal program.

Public Resources Code § 30242

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

Regional and Local: Humboldt County

County Administration of the Williamson Act

Humboldt County Board of Supervisors first adopted guidelines for the Williamson Act locally on June 24, 1969. The Board, in June of 2002, adopted the first comprehensive update to the local Guidelines since 1978 to reflect major changes to the Williamson Act, including the 1998 adoption of Government Code Section 51296, otherwise known as the Farmland Security Zone (FSZ). The FSZ allowed property owners enrolled in this program to have the option of extended contracts, from 10 years to a 20-year term, and in exchange, receive an additional 35% tax reduction. The FSZ is designed for prime lands or lands designated on the Important Farmland Series Maps and applies to lands lying within 3 miles of the adopted Sphere of Influence of incorporated cities. The Board's most recent update to the guidelines was in 2005.

From 1972 to 1981, nearly 243,000 acres were put under Williamson Act contracts in the County. In 2001 there were just over 273,000 acres in the program (in 145 established preserves), indicating that participation had not significantly increased in over 20 years.

Humboldt County General Plan

Most of the Project area is zoned AE-60/W, F, R, T. The exception is Centerville and Cut-off sloughs, which are zoned NR/R.

Based on the Humboldt County General Plan (HCGP 1983), 1,707 acres or 92 percent of the Project area is designated for agricultural uses (Agricultural Exclusive [AE] land use designation (Figure 3.2-7.) Approximately 527 acres are zoned NR/R for natural resource use. Conditionally permitted uses for parcels zoned AE include natural resource uses, such as wetland restoration and fish and wildlife habitat management.

The HCGP includes a goal that:

> *"The optimum amount of agricultural land shall be conserved for and maintained in agricultural use to promote and increase Humboldt County's agricultural production."*

Much of the HCGP's discussion of agricultural protection concerns conversion of agricultural land to urban use. The following agricultural protection policies are relevant to the Project's conversion of agricultural land to natural resource use:

1. Agricultural lands shall be conserved and conflicts minimized between agricultural and non-agricultural uses through the following:

B. By focusing future conversions in areas where land use conflicts would not threaten the viability of existing agriculture.

D. By allowing development of uneconomical or marginally viable agricultural land, or agricultural lands already severely limited by conflicts with urban uses to limit the market pressures for conversion of more productive lands.

E. By assuring that public service and facility expansions and non-agricultural development do not inhibit agricultural viability through degraded water supplies, access systems, air quality, and other relevant considerations, such as increased assessment costs.

4. Prime agricultural land should be retained in parcel sizes large enough to provide for an economic management base.

10. The conversion of agricultural land should only be considered where continued agricultural production is not economically feasible and proposed development is consistent with Remote Rural Development Section 2550.

Eel River Area Plan

The proposed Project is in the Coastal Zone, and the County of Humboldt administers the Coastal Act in the Project Area via the Local Coastal Program (LCP) Eel River Area Plan (ERAP). The ERAP was certified by the Coastal Commission in 1982 and last updated in 1995. The ERAP outlines numerous policies pertaining to the preservation and restoration of sensitive coastal habitat, as well as strong provisions in support of agriculture. All of these policies have influenced the development of the proposed Project designs intended to address agricultural preservation and habitat restoration within the Coastal Zone generally, and within the jurisdiction of Humboldt County's ERAP area, particularly.

3.34 A. Identification of Agricultural Lands – Prime/Non-Prime

1. Lands outside Urban Limit Lines that are prime agricultural lands based on the adopted definition of prime lands of the State of California shall be planned for continued agricultural use, and no division or development of such lands shall be approved which would lower the economic viability of continued agricultural operations on them.

3.41 C. Transitional Agricultural Wetlands Identification and Development Policies

1. Transitional Agricultural lands are wetlands as defined in Chapter 6 (Definitions) of this Plan.

2. Allowable uses in Transitional Agricultural Lands: Within transitional agricultural lands planned for Agriculture Exclusive, agriculture is the principal use in these areas but shall maintain long-term protection by ensuring new development is consistent with the provisions of this policy…."

b. Diking and filling for new development in transitional agricultural lands shall be limited to…the principal uses in agricultural exclusive designation, including construction of spillways and modification or repair of existing dikes threatened by erosion.

c. Dredging in transitional agricultural lands shall be limited to…maintenance and repair of existing tidegates, floodgates, dikes, levees and other drainage works, including replacement of drainage works damaged by flood or tidal surges.

e. Mitigation for these uses by restoration of tidal action or removal of fill…is not feasible and shall not be required. Mitigation should where feasible take place in the Eel River Planning Area and where practicable as close as possible to the development."

With regard to the protection and enhancement of natural resources, Section 3.34 B states that management for watershed and fish and wildlife is a compatible use with agriculture.

In addition to the above guidelines, the following policies are applicable to the proposed Project.

Policy 3.41: "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values"

Policy 3.41 1.a.(2): "The County shall continue to pursue opportunities to restore or enhance, if possible, in-stream flows"

Policy 3.41 F.6.a: "long-term protection of riparian vegetation . . . should be provided. . . . To achieve these objectives, the County should work with property owners and affected State and Federal agencies"

Policy 3.41 G.7: "Natural drainage courses . . . shall be retained and protected from development which would impede the natural drainage pattern or have a significant adverse effect on water quality or wildlife habitat."

Humboldt County Zoning Regulations

The Humboldt County Zoning Regulations were revised April 30, 2007, and provide clear guidance on allowable uses in the Project area. In particular, Section 313-35 defines combining zone designations for Transitional Agricultural Lands:

35.1.1 Purpose. The purpose of these regulations is to permit agricultural use as a principal permitted use while providing that development in transitional agricultural lands is conducted in such a manner as to maintain long-term wetland habitat values and minimize short-term habitat degradation within these environmentally sensitive habitat areas.

35.1.2 Applicability. These regulations shall apply to land containing transitional agricultural land designated "T" on the Zoning Maps , and to unmapped areas as defined in this Chapter, Section C…."

35.1.9 Permitted Diking and Filling. Permitted diking and filling shall be limited to the following developments:

35.1.9.1 Principal permitted uses in the AE Agricultural Exclusive zone.

35.1.9.2 Construction of spillways and modification and repair of existing dikes threatened by erosion. Modification of dikes includes minor relocation….provided, however, that there is no significant increase in gross acreage under cultivation.

35.1.9.5 Wetland Restoration

35.1.10 Permitted Dredging. Dredging in Transitional Agricultural land shall be limited to:

35.1.10.2 Maintenance or replacement of levees, roads, fences, dikes, drainage channels, floodgates, and tide gates;

35.1.10.3 Maintenance dredging for flood control and drainage purposes; and

35.1.10.4 Wetlands, fishery and wildlife enhancement, and restoration projects.

35.1.12 Findings Required. Prior to approval of new development within Transitional Agricultural Lands, the applicable Resource Protection Impact Findings of Chapter 2, Procedures, Supplemental Findings, shall be made.

3.2.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would be considered to have a significant impact on agricultural resources if it would result in any of the following:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps for the Farmland Mapping and Monitoring Program by the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract; or
- Involve other changes in the existing environment, which because of their location or nature, could result in conversion of Farmland to non-agricultural use.

The Project converts prime and non-prime farmland to non-agricultural use, but also converts non-agricultural land and non-prime agricultural land to prime agricultural land. This balancing is achieved through numerous methods described in the Project Description and earlier in this chapter. Due in large part to the substantial size and broad scope of the Project, this EIR's significance threshold for conversion of prime farmland is any net permanent conversion of more than 2% of prime farmland within the entire Project area to non-agricultural use.

Inapplicable Criterion

The following significance criterion is not discussed further in the impact analysis, for the following reasons:

- **Would the Project result in the loss of forest land or conversion of forest land to non-forest use?** There are no forest lands on the Project site; therefore, no forest land would be converted to non-forest use.

3.2.4 Methodology

The following sections describe the anticipated environmental impacts on agricultural production and soils due to the proposed Project. The impact analysis included in this section is based on the various field studies and agricultural resources investigations and analyses conducted for the Project by GHD, Inc., State Coastal Conservancy and others as described above.

The analytical approach used for the assessment of impacts and benefits to agricultural resources was to assign estimated productivity levels based upon a comparison of nearby forage rates, refine those estimates based upon site-specific conditions such as soil chemistry, salinity, vegetation characteristics, stocking rates, irrigation availability, and more, establish the extent of prime status land and then calculate impacts and benefits based on site-specific gains or losses of productivity resulting from the Project. The premise of this analytical approach is that if agricultural production levels on currently impaired or non-agriculturally developed areas can be improved by the Project and managed for more consistent agricultural production, than those gains will offset losses resulting elsewhere on the property due to Project components that result in the permanent conversion of agricultural land to other uses. The benefit of this approach is to provide a precise

pasture-by-pasture and acre-by-acre assessment of the net overall change to the agricultural environment as a result of the Project.

It is important to note that some of the tables presented in this chapter were generated using GIS tools that present a higher level of precision than is possible through the actual fieldwork that generated the data. For example, vegetation alliances might present a margin of error of 1 to 2 acres, while a GIS characterization of acreage is accurate to the hundredth decimal point. Nonetheless, the overall quantification and analysis is believed to be at a suitable level of precision for this assessment of Project impacts.

Farmland Evaluation for Proposed Project

Appendix G to the CEQA Guidelines suggests a finding of significance if a project will convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps for the Farmland Mapping and Monitoring Program by the California Natural Resources Agency, to non-agricultural uses. Therefore, evaluation of Project impacts to agricultural resources is a twofold assessment of the productive status of agricultural land in the Project area, and subsequently whether or not it attains prime status as defined under the Government Code as referenced in the Coastal Act, or the Local Coastal Program. Much of the Project area is productive, some is prime, and significant parts of the Project area have the potential to become both through Project actions. Conversely, the productivity of other areas is limited by natural conditions that are unlikely to improve and will likely deteriorate below already sub-prime status. Most of the Project area is zoned AE-60/W, F, R, T. The exception is Centerville and Cut-off sloughs, which are zoned NR/R. (Figure 3.2-7).

Evaluation of each pasture in the Project area must consider production levels as measured in any of three categories: grazing levels, hay production and silage production. Ideally, a pasture provides flexibility amongst these three components of forage production. However, few pastures can provide all three elements consistently. For instance, hay production is highly limited due to topography and weather. Even when haying equipment can access a particular pasture, which is not true of all pastures on the EREP, the foggy conditions, salt air, early storms, and general moisture levels frequently prevent drying and baling grass once cut. Hence, silage is a more dependable method of non-grazing harvest of forage, though it too is limited by topography. Except when limited by wet conditions, grazing and/or stocking rates are the most predictable and reliable means of utilizing the productive pastures of the Project area, and the most realistic tool for assessing productivity levels. As a conservative and frequently used metric for evaluating production levels, production of dry residual matter (PDM) is used as a metric for comparing existing and prospective agricultural productivity.

The 2013 data collection effort and subsequent analyses sought to establish definitively the agricultural productivity of the Project area. Project proponents then sought to improve the proposed Project design by avoiding or minimizing impacts to prime or near prime agricultural areas. Simultaneously, Project proponents sought opportunities to increase existing agricultural productivity to prime or near prime status within the Project area as a result of Project activities.

The evaluation of productive status was based on Government Code definitions of prime agricultural land as referenced in the Humboldt County General Plan (HCGP) and the Coastal Act. The two sources define prime agricultural land in essentially the same way, although the Coastal Act is more restrictive by virtue of the fact that it defines prime agricultural land as land that meets any one of criteria a-e in the definition below (PRC Division 20, Section 30113).

a) Land which qualifies for rating as Class I or Class II in LCC as determined/rated by the United States Department of Agriculture's Natural Resource Conservation Service (NRCS).

b) Storie Index Rating 80 to 100.

c) Land that supports livestock used for the production of food and fiber and which has an annual carrying capacity equivalent to at least 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 return during the commercial bearing period on an annual basis from the production of unprocessed agricultural plant production not less than $200 per acre.

e) Land which has returned from the production of unprocessed agricultural plant products on an annual gross value of not less than $200 per acre for three of the five previous years.

Additionally, the Humboldt County General Plan includes in their definition:

f) "Lands adjacent to a, b, or c, 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

Project features are proposed on land that overall does not meet conditions a, b or c, and that is not adjacent to nor contiguous with surrounding parcels. Condition f is therefore not considered further in this analysis.

Due to the superior growing conditions present in the Eel River Delta, much land that does not possess "prime soil" designations referenced in a and b, above, may nonetheless exhibit prime characteristics and notably high production levels. For example, although Swainslough-Occidental soil is "not prime" by NRCS standards, parts of the EREP with this soil type would be "land which has returned from the production of unprocessed agricultural plant products on an annual gross value of not less than $200 per acre for three of the five previous years" thus achieving "prime" status.

For purposes of this analysis, hay is assumed to be $150/ton. This value is somewhat conservative and attempts to compensate for the volatility of a product whose price varies due to a variety of factors such as shipping costs, climate, weather conditions and demand. In order for pasture to meet the prime agricultural land value under section (e), it must produce in excess of 1.33 tons per acre over the course of three of the last five years. As measured in pounds/acre/month, this equates to 297 pounds/acre of dry matter being produced and fully utilized nine months out of the year for three of the last five years, achieving a per acre value of $200.27. This is a generous and somewhat unrealistic evaluation of the true status of pasture and its productivity in such a volatile environment. First, it assumes a dry weight matter value that is typically measured in terms of hay as a delivered product. Second, it assumes that the material is dry in an area characterized by foggy summers, salt-breeze off the ocean and ample precipitation. Third, the probability of most pastures within the Project area achieving full production levels for nine months of the year is extremely low, since the peak growing season is primarily April-September. Nonetheless, for purposes of this analysis, it is assumed that grazing productivity at this level might be achieved under optimum conditions for this period of time.

As demonstrated at length in the agricultural analyses performed for the development of the Salt River Ecosystem Restoration Project (SRERP), this value falls neatly into the median range of the low end of productivity values for dairies and pastures in the upper Salt River watershed. This comparative valuation validates this analysis due to several important distinctions between the upper Salt River and the Project Area. First, in the upper Salt River, soil types are higher in elevation, loamier and more fertile, substantially more fertilized with dairy operations, less susceptible to salt blasts, fog and moisture and generally more favorable in the analyzed portions of the upper Salt River (e.g. Ferndale, Arlynda, Weott, etc.) versus the Project Area (e.g. Occidental, Swainslough-Occidental Complex). Soil chemistry is an important consideration; the saline-sodic influence in the Project area is pronounced, versus non-saline-sodic soils in the upper Salt River area. Third, as mentioned, above, the pastures evaluated for productivity rates for the SRERP productivity analysis are highly fertilized with manure from denser concentrations of dairy cows, further increasing their productivity, and then heavily irrigated for at least five months out of the year. Project area pastures subject to proposed actions are neither fertilized, nor irrigated. Finally, grass growth rate is high during the spring and summer months and relatively low during the winter months. Most of the Project area enjoys predictable growth rates, but some do not. Some parts of the Project area are subject to wave overwash, ponding, inundation, avulsion or other features that diminish growth and compromise productivity. This dynamic is often amplified by periods of high rainfall, El Nino events, and other situations described above.

Another metric used to analyse the status of agricultural land is the consumption rate of the livestock. Analysis of agricultural productivity for the SRERP was based upon the consumption rates of actively milked dairy cows, which on average consume an estimated 27 pounds Total Dry Matter (TDM) per day. However, the Project area supports replacement heifers and beef cattle, opportunistic feeders with lower feed requirements, livestock that are unlikely to need or obtain such high and predictable amounts of feed. Most literature points to a Total Dry Matter (TDM) consumption rate that ranges from 10-20 pounds per day (lbs/day) for beef cattle (NRC 1996). Ensminger suggests an even lower range for a cow-calf pair no higher than 18 lbs. Total Daily Nutrient (TDN). For purposes of this analysis, the range of feed available is based on stocking rates, vegetation types, and duration of grazing on any given pasture. Depending upon the pasture, this feed rate is estimated at 20 pounds TDM per day.

The following summary evaluates productivity levels as measured in pounds of average TDM produced per acre/month within the Project area, and defines which land in the Project area meets the standard for prime agricultural land. Current versus proposed conditions for these pastures are graphically represented on Figures 3.2-8 and 3.2-9.

Outer Marsh

This 282 acre area north of the inner marsh is salt marsh, inaccessible as pasture, and was abandoned for agricultural production following the 1964 flood. Its EC rating is 15.4 rendering it fully unusable. None of it meets the standard of prime or even productive agricultural land. No Project activities are proposed in this area.

Inner Marsh

The Inner Marsh is comprised of two separate pastures, the North Levees pasture, and the 70 acre Pasture.

The North Levee pasture is 75 acres, and approximately 52 acres are pasture and/or agricultural wetland. A total of 22 acres are entirely unproductive non-agricultural (dune, saltmarsh, open water). TWC manages the 48 acres of pasture for agricultural and natural resource purposes, consistent with the zoning.

Due to both distance of the site, challenges associated with moving cattle onto and off of this pasture, as well as varying flooding and ponding levels and habitat enhancement goals, the pasture is intensively flash-grazed every 3 to 5 years. The pasture is only capable of supporting livestock for a brief period of time in the late summer. Haying is impossible due to the terrain, and livestock mobility is limited due to the network of sloughs and channels. The productivity of the 52 usable acres ranges from 225 lbs/acre (47 acres) to 450 lbs/acre (5 acres) per month. Based on stocking rates and overall utility the North Levee pasture does not meet the definition of prime agricultural land. That finding is supported by the fact that this area is predominated by saline-sodic Occidental soil type that ranges from 2.3 to 10.4 EC.

The 70 acre pasture is 72 acres, 67 acres of which are in pasture/agricultural wetland. A total of 5 acres are entirely unproductive (slough, saltmarsh). EC ranges widely from 4.9 to 11.5. That portion of the pasture available for grazing is comprised of 50% *Agrostis stolonifera* (creeping bentgrass), and 50% *Distichlis spicata* (saltgrass), relatively low value and salt tolerant pasture species. Due to the vegetation composition, livestock on this pasture are also dependent upon supplemental feeding and supplements to provide the nutritional content that the forage there fails to provide. The area falls within the low range of the Project area with respect to productivity. On average, it is estimated to produce less than 225 lbs/acre/month.

The pasture has a long tradition of grazing, though not every year. Stocking, typically with yearlings, begins at low levels in spring and achieves high levels in the late summer for a period of 1-2 months, with supplemental feeding. Grazing is productive in summer for this 1-2 month window. Because of the sporadic grazing, thatch can predominate in the area. Haying is impossible due to the terrain, which is characterized by channels and micro-channels that have persisted for more than 100 years. Access to the site is also challenging due to the road conditions, lack of adequate turn-arounds and distance from the main barn.

Periodic use, vegetation types, high stocking rates for brief periods and the corresponding inability to hay due to the terrain, dictate that the 70 acre Pasture does not meet the definition of prime agricultural land. That finding is supported by the fact that this area is predominated by non-prime, saline-sodic Occidental soil type, and is frequently subject to inundation and ponding.

North Barn

This pasture is 32 acres in size, but is predominantly Beaches-Samoa Dune land complex of 0-50% slope, predominated by *Juncus breweri* (Brewer's rush), with minor areas of *Agrostis-Distichilis* complex. EC is 11.5, grazing is feasible, and historic, but stocking rates, salinity and soil types demonstrate this pasture's incapability of achieving prime status or even particularly productive status.

Duck Club

The Duck Club pasture is 128 acres, 64 of which is pasture/agricultural wetland, and 62 acres of which is Freshwater Emergent Herbaceous of little or no forage value (*Schoenoplectus pungens*, *Eleocharis macrostachya*), with an additional 2 acres of saltmarsh and other low-productivity vegetation types. EC is relatively low, ranging from 3.0-5.2.

One of the most notable characteristics of the Duck Club pasture is the persistence of a remnant Centerville Slough along the northwestern boundary of the pasture. Characterized by low value forage (*Juncus lescurii* and standing water), this portion of the Project area is mostly unusable, and decidedly non-prime and unproductive. In general, this area is unusable for agriculture, and certainly fails to reach prime status. Its productivity status is estimated to be between 0-50 lbs/acre/month.

Table 3.2-4 Change in Agricultural Productivity (in acres)

			Area where Agricultural Productivity values are Changing (Acres)										
			0			50	100	225	300	350	450	700	750
			Non-Ag	Not Prime Ag	Total	Not Prime Ag	Not Prime Ag	Not Prime Ag	Prime Ag	Prime Ag	Prime Ag	Prime Ag	Prime Ag
Russ	Pasture 1	existing	135.7	2.5	138.3			9.6		0.4	0.1	1.5	
		Proposed	138.2	0.0	138.3			11.3			0.1	0.3	0.0
		change	**2.5**	**-2.5**	**0.0**	**0.0**	**0.0**	**1.6**	**0.0**	**-0.4**	**0.0**	**-1.3**	**0.0**
	Pasture 2	**existing**	**21.6**	**7.1**	**28.7**			**0.1**			**4.3**	**0.3**	**330.2**
		Proposed	**17.7**		**17.7**			**7.0**			**2.9**	**4.2**	**331.9**
		change	**-3.9**	**-7.1**	**-11.0**	**0.0**	**0.0**	**6.9**	**0.0**	**0.0**	**-1.4**	**3.9**	**1.6**
	Russ Total	*existing*	*157.4*	*9.6*	*167.0*			*9.8*		*0.4*	*4.5*	*1.9*	*330.2*
		Proposed	*155.9*	*0.0*	*156.0*			*18.3*			*3.1*	*4.4*	*331.9*
		change	***-1.4***	***-9.6***	***-11.0***	***0.0***	***0.0***	***8.5***	***0.0***	***-0.4***	***-1.4***	***2.6***	***1.7***
TWC	100 Acre	existing	1.9	6.3	8.2			4.7		2.9	81.4		
		Proposed	1.9		1.9			10.9	0.0	2.9	39.8	41.6	
		change	**0.0**	**-6.3**	**-6.2**	**0.0**	**0.0**	**6.2**	**0.0**	**0.0**	**-41.6**	**41.6**	**0.0**
	70 Acre	existing	4.9		4.9			67.2					
		Proposed	66.2		66.2			5.9					
		change	**61.3**	**0.0**	**61.3**	**0.0**	**0.0**	**-61.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Access Route Pasture	existing	1.8	1.1	3.0			1.0		0.2	2.0	2.3	
		Proposed	1.8		1.8			2.1		0.2	2.0	2.3	
		change	**0.0**	**-1.1**	**-1.1**	**0.0**	**0.0**	**1.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Duck Club	existing	3.4	11.5	14.9	49.4		30.0		20.3	13.6		
		Proposed	14.2		14.2			98.9			15.2		
		change	**10.8**	**-11.5**	**-0.7**	**-49.4**	**0.0**	**68.8**	**0.0**	**-20.3**	**1.6**	**0.0**	**0.0**
	North Barn	existing	25.3	0.0	25.3			5.8				1.3	
		Proposed	26.7		26.7			5.6					
		change	**1.5**	**0.0**	**1.4**	**0.0**	**0.0**	**-0.1**	**0.0**	**0.0**	**0.0**	**-1.3**	**0.0**
	North Levees	existing	21.3	0.2	21.5	0.6		47.1			5.6		
		Proposed	56.0		56.0			13.1			5.6		
		change	**34.7**	**-0.2**	**34.5**	**-0.6**	**0.0**	**-34.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**
	Quonset	existing	1.1		1.1						30.9		17.3
		Proposed	1.1		1.1						30.9		17.3
		change	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Sick Pen	existing	0.0		0.0							2.4	
		Proposed	0.0		0.0							2.4	
		change	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Western 40	existing									0.2		46.5
		Proposed	2.0		2.0						0.4		44.3
		change	**2.0**	**0.0**	**2.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.0**	**-2.2**
	Western Pastures	existing	3.9	1.4	5.3	14.0	9.2	39.8		25.7	68.6	24.8	
		Proposed	20.8		20.8			24.4	4.2	0.5	14.5	123.1	
		change	**16.9**	**-1.4**	**15.5**	**-14.0**	**-9.2**	**-15.5**	**4.2**	**-25.2**	**-54.1**	**98.2**	**0.0**
	Williams	existing	1.5		1.5								44.4
		Proposed	1.5		1.5								44.4
		change	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	TWC Total	*existing*	*65.0*	*20.6*	*85.6*	*64.0*	*9.2*	*195.6*		*49.1*	*202.3*	*30.9*	*108.2*
		Proposed	*192.2*		*192.2*			*160.8*	*4.2*	*3.6*	*108.5*	*169.4*	*106.0*
		change	***127.2***	***-20.6***	***106.7***	***-64.0***	***-9.2***	***-34.8***	***4.2***	***-45.5***	***-93.8***	***138.6***	***-2.2***
Combined Properties		**existing**	**222.4**	**30.2**	**252.6**	**64.0**	**9.2**	**205.3**		**49.5**	**206.8**	**32.7**	**438.4**
		Proposed	**348.2**	**0.0**	**348.2**			**179.1**	**4.2**	**3.6**	**111.6**	**173.8**	**437.9**
		change	**125.8**	**-30.1**	**95.7**	**-64.0**	**-9.2**	**-26.2**	**4.2**	**-45.9**	**-95.2**	**141.1**	**-0.5**

Table 3.2-5 Change in Agricultural Productivity (in lbs)

		Change in Productivity (lbs/month)									
Owner	Productivity Rate (lbs/acre)	0	50	100	225	300	350	450	700	750	Total Productivity
Russ	Pasture 1	0.0	0.0	0.0	366.7	0.0	-127.9	-11.3	-899.7	23.7	**-648.6**
	Pasture 2	0.0	0.0	0.0	1,552.1	0.0	0.0	-615.1	2,698.0	1,223.1	**4,858.1**
	Russ Total	*0.0*	*0.0*	*0.0*	*1,918.8*	*0.0*	*-127.9*	*-626.5*	*1,798.3*	*1,246.8*	***4,209.5***
TWC	100 Acre	0.0	0.0	0.0	1,394.7	7.7	0.0	-18,717.4	29,109.9	0.0	**11,794.9**
	70 Acre	0.0	0.0	0.0	-13,797.0	0.0	0.0	0.0	0.0	0.0	**-13,797.0**
	Access Route Pasture	0.0	0.0	0.0	255.7	0.0	0.0	0.0	-2.3	0.0	**253.4**
	Duck Club	0.0	-2,471.8	0.0	15,487.7	0.0	-7,095.3	721.7	0.0	0.0	**6,642.3**
	North Barn	0.0	0.0	0.0	-32.4	0.0	0.0	0.0	-893.8	0.0	**-926.1**
	North Levees	0.0	-27.9	0.0	-7,654.7	0.0	0.0	27.7	0.0	0.0	**-7,654.9**
	Quonset	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	Sick Pen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	Western 40	0.0	0.0	0.0	0.0	0.0	0.0	91.3	0.0	-1,622.4	**-1,531.1**
	Western Pastures	0.0	-697.9	-922.6	-3,478.9	1,247.4	-8,826.8	-24,323.3	68,772.0	0.0	**31,769.9**
	Williams	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**
	TWC Total	*0.0*	*-3,197.6*	*-922.6*	*-7,824.9*	*1,255.1*	*-15,922.1*	*-42,200.1*	*96,985.9*	*-1,622.4*	***26,551.4***
Combined Properties		**0.0**	***-3,197.6***	***-922.6***	***-5,906.1***	***1,255.1***	***-16,050.0***	***-42,826.6***	***98,784.2***	***-375.6***	***34,977.3***

Table 3.2-6 Agriculture Conversions (in acres)

		Non-Ag to Prime Ag	Not Prime Ag to Prime Ag	Prime Ag to Non-Ag	Prime Ag to Not Prime Ag	Non-Ag to Not Prime Ag	Not Prime Ag to Non-Ag	No Change	Net Change in Prime Ag	Net Change in Ag Land
Owner	Pasture Name	(+ Prime) (+ Ag)	(+ Prime)	(- Prime) (-Ag)	(-Prime)	(+Ag)	(-Ag)			
Russ	Pasture 1	0.0		0.4	1.2		2.1	146.2	-1.6	-2.5
	Pasture 2	6.2	0.2	2.3			0.0	355.0	4.1	3.9
	Russ Total	*6.2*	*0.2*	*2.7*	*1.2*		*2.1*	*501.2*	*2.5*	*1.4*
TWC	100 Acre		0.1	0.0				97.0	0.0	0.0
	70 Acre						61.3	10.8	0.0	-61.3
	Access Route Pasture			0.0				8.5	0.0	0.0
	Duck Club	0.0	0.8	0.6	18.8		10.2	97.8	-18.7	-10.8
	North Barn			1.3			0.2	30.9	-1.3	-1.5
	North Levees	0.2	0.2	0.3			34.6	39.4	0.1	-34.7
	Quonset							49.3	0.0	0.0
	Sick Pen							2.4	0.0	0.0
	Western 40			2.0				44.8	-2.0	-2.0
	Western Pastures	1.7	28.4	7.0	0.0		11.7	138.7	23.1	-16.9
	Williams							45.8	0.0	0.0
	TWC Total	*2.0*	*29.4*	*11.2*	*18.8*		*118.0*	*565.4*	*1.3*	*-127.2*
Combined Properties		**8.2**	**29.6**	**13.9**	**20.1**		**120.1**	**1066.6**	**3.8**	**-125.8**

Another important aspect of this pasture is its discontinuous tradition of grazing influenced by the operation of the historic Eel River Gun Club (ERGC). More frequently grazed in the past, infrastructure and drainage maintenance concerns expressed by members of the ERGC in recent years have prompted TWC to reduce grazing there in order to protect existing berms and infrastructure associated with the club and drainage in the area. Thus, the area does not achieve the standard for prime set in condition (e) since it has not returned $200/acre value in three of the last five years, though it could under improved management.

In contrast, the 64 acres of in the southern portion of the pasture bordering the 100 acre pasture and the Western Pastures is productive and reaches a productivity level ranging from 225-450/lbs/acre/month approaching and possibly meeting prime status.

This range of productivity and status on the southerly 64 acres is attributed to the status of Russ Creek and that portion of the pasture where the Duck Club, 100 acre and Western Pastures meet. At this intersection Russ Creek periodically avulses, depositing sediment, diminishing or even eliminating agricultural production in the avulsion area. This is described in greater detail under the Western Pastures section, below. The southern portions, including some Weott soil type (prime), can be hayed, and probably support at least one Animal Unit Month (AUM), thereby meeting the definition of prime agricultural land on several counts. Based on this recurring avulsion and its impacts on vegetation, 30 acres remain prime and unaffected, while 34 acres are rendered non-prime.

Western Pastures

The Western Pastures comprise 187 acres, 166 of which is pasture/agricultural wetland, and most of which is quite productive. The soil type is Occidental (non-prime), *Swainslough-Occidental* complex, and Weott (prime if irrigated). The northern portion is primarily *Agrostis-Distichilis* complex, while the southern portion is *Agrostis-Argentina* (silverweed) complex, with another portion in *Festuca perenne* (ryegrass), an excellent pasture species. EC ranges from 1-6.7. The Western Pastures area is level and highly suitable for both grazing and haying. Production levels are generally high, suggesting that 120 of the 166 acres are prime, even if soils counter-indicate by NRCS classification.

There are important exceptions. First, remnant channels, ponds and other features are characterized by dramatic vegetation shifts towards less common or desirable pasture species (*Argentina egedii*, *Juncus brewerii*). These areas comprise approximately 20 acres.

Second, the pasture is susceptible to avulsions from Russ Creek/Western Drainage Ditch. The most notable such location is at that portion of the pasture where the Duck Club, 100 acre and Western Pastures meet (Figure 3.2-4, Table 3.2-1.) At this intersection Russ Creek periodically avulses, depositing sediment, drastically reducing or even eliminating agricultural production in the avulsion area. Historically, avulsions were managed through establishment of artificial cells ~40 acres in size, but in the absence of that practice the avulsions average 115 acres in size. Although the area has the strong potential to be at prime level of productivity, the area is not due to the unpredictable avulsions and consequent shift of vegetation types away from desirable pasture species. Characterized now by *Rumex crispus*, Ruderal/invasive species, the area has no productive value, and has not reliably produced for three of the last five years. While these areas can always be tilled and re-seeded, the unpredictable utility of the area diminishes the productivity below a level of prime pasture that can be hayed routinely and predictably hayed or grazed to support one AUM. Managing avulsions here would certainly improve productivity in this portion of the Project area.

Another exception is the western portion of the Western Pastures, now subjected to dune-breach events. These occurrences tend to deposit sand and large woody debris around the western portion of the pasture. The sand and saltwater converts pasture to salt marsh, while the deposit of large woody debris prevents haying, unless the material is relocated. The area influenced by saltwater intrusion is approximately 40 acres in size. Consequently, the dune avulsion area has been rendered non-prime. The area affected by wood deposits is approximately 7 acres of unproductive pasture. Relocating the material is not considered cost effective, due to the small size of the area, so haying is infeasible.

Finally, the productivity of much of the Western Pastures is entirely dependent upon the functionality of the Western Drainage Ditch, a dubious proposition as the existing dunes migrate eastward, sanding in of the ditch intensifies and breach events become more common.

100 acres within the avulsion area are not prime, and exhibit a productivity rate near zero. However, with proper management the productivity of this area could increase to at least 700/lbs./acre/month, making it both prime and very productive.

Western 40

The Western 40 pasture, a 46 acre pasture, is highly productive pasture characterized by Worswick (prime) soils, and meets the definitions for prime agricultural land. It is primarily Festuca vegetation. EC is low at 3.0.

100 acre Pasture

The 100 acre pasture, 97 acres in size, is highly productive, primarily Weott soil, and is primarily *Agrostis*/*Argentina* complex with relatively high productivity. Most of it meets the definition of prime, with productivity levels in the 450-700 lbs/acre/month range. EC ranges from 1.9 – 7.2. The exceptions to the overall high productivity are three developed acres, and 9 acre areas of *Juncus effuses* and *Argentina* that are not prime and in the productivity range of 0-225 lbs/acre/month. These are areas affected by the avulsions, and likely to improve as a result of the Project to productivity levels in the 450-700 lbs/acre/month range.

9 acres within the avulsion area are not prime, and exhibit a productivity rate near zero. However, with proper management the productivity of this area could increase to at least 450-700/lbs/acre/month, making it both prime and productive

Quonset Hut

The Quonset Hut pasture, 48 acres in size, is highly productive, primarily Loleta soil, possesses EC rates of 0.3, and with the exception of one developed acre meets the definitions for prime agricultural land.

Williams

The Williams pasture, 46 acres in size, is the most productive pasture in the Project area, primarily Loleta soil, EC rates of 0.2-0.4, and with the exception of one developed acre meets the definitions for prime agricultural land.

Russ Family: Pasture 1 (Angels Camp)

RR&T Pasture 1 comprises 151 acres of land that is Occidental soil. Most of this area, including Angels Camp, has suffered from wave overwash and conversion from pasture to salt marsh. EC is unknown, but likely in excess of 15.0. Approximately 10 acres show some agricultural productivity of approximately 225 lbs/acre/month. None is prime.

Russ Family: Pasture 2 (Remainder of Russ Family Property)

RR&T Pasture 2 is the remainder of agricultural land in Russ ownership within the Project footprint. It comprises 450 acres of land that is primarily Worswick and Weott soils to the west, with a minor amount of Occidental soil, and Arlynda and Loleta soils to the east. The entire area is under cultivation, is quite productive and is considered prime. The only areas lower in productivity are depressional areas such as ephemeral ponds, swales or ditches. Pasture 2 is comparable in soil type and productivity levels to the adjacent Western 40 or even Williams pastures on EREP. EC is unknown, but probably higher in areas bordering Pasture 1 and lower on lands to the east.

In summary, prime and not-prime status is readily determined pasture by pasture. All evidence including prior analyses, interviews, stocking rates, soil types, soil chemistry and vegetation characteristics validate this methodology for one key reason: Geography. These data trend uniformly and similarly from north to south regardless of property boundaries, with higher productivity lands to the south, and less productive and reliable land towards the north. Similarly, land at greatest risk of conversion to saline-sodic conditions and incapable of supporting pasture lies to the west, while the most promising areas for future agricultural management fall in the center or East of the Project area.

3.2.5 Impacts and Mitigation Measures

Impact AR-1: Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps for the Farmland Mapping and Monitoring Program by the California Natural Resources Agency, to non-agricultural uses.

The Project converts prime (14 acres) and non-prime farmland (120 acres) to non-agricultural use. Unlike most development projects analysed under CEQA, however, the Project also converts non-agricultural land and non-prime agricultural land to prime agricultural land. Therefore, and as discussed in Section 3.2-3, above, this EIR's significance threshold for conversion of prime farmland is any permanent net conversion of more than 2% of prime farmland within the entire Project area to non-agricultural use.

The Project will result in both losses of agricultural land through conversion to non-agricultural uses, and increases in productivity resulting from the conversion of either non-agricultural or non-prime agricultural land to prime status. These changes are all depicted in various ways in Figure 3.2-8, 3.2-9 and Figures 3.2-11, as well as in Tables 3.2-4, 3.2-5 and 3.2-6, and discussed at length in this chapter. The Project will clearly and demonstrably result in a net increase in agricultural productivity as measured in both PDM and AUMs for the Project area through various means discussed, below. Pasture-specific and net changes and conversions are summarized on Table 3.2-6, and also discussed below. The net change overall is a modest increase in prime agricultural land (4 acres) available for agricultural use, and a significant increase in overall pasture productivity for the Project area, hence a finding that the Project impacts to agricultural resources are less than significant.

Agricultural Conversions and Losses

In order to improve agricultural productivity throughout the Project area, the proposed Project will permanently convert a total of 134 acres of agricultural land to non-agricultural use (120 non-prime, 14 prime farmland) to achieve the goals and objectives of the Project. The conversion is necessary to re-establish a hydraulically functional improved and augmented drainage network that has significant natural resource benefits. In general, conversions of agricultural land to non-agricultural

use will occur in the northern or western portion of the Project area where productivity levels are lowest.

The Project will also convert 30 acres of non-prime agricultural land of low agricultural utility to prime status and 8 acres of non-agricultural land to prime-agricultural land. These increases in productivity will occur as a result of Project features and management activities in areas where land, soil or elevation exhibit characteristics capable of this anticipated increase in acreage or productivity to a prime and productive status.

Projected impacts are detailed by pasture, below, and outlined in tabular form in Tables 3.2-3, 3.2-4 and summarized in Table 3.2-6 for pasture-specific and net changes in status. Productivity data informing the following narratives is summarized in Table 3.2-5, and status shifts informing the following narratives in Table 3.2-6. Existing and proposed productivity rates discussed below are graphically summarized in Figures 3.2-8 and 3.2-9, respectively. More detailed presentation of data can be found on the other tables and graphics in this chapter.

Outer Marsh

None of this area meets the standard of prime or even productive agricultural land. No work is proposed in this area. No impacts to agricultural resources occur here.

Inner Marsh

The Inner Marsh is comprised of two separate pastures, the North Levees pasture (75 acres), and the 70 acre Pasture (72 acres).

The Project will impact approximately 35 acres of non-prime agricultural soil in the North Levee Pasture by inundation reducing productivity on 35 acres from existing production levels of <225 lbs/acre/month to zero.

The Project will impact 61 acres of non-prime agricultural soil in the 70 acre pasture by inundation reducing productivity from a current estimated <-225 lbs./acre/month to zero.

A portion of this pasture would only be inundated seasonally, and would therefore not experience permanent conversion. Nonetheless, vegetation characteristics would change as a result of inundation with more saline water and productivity would decline significantly. TWC would retain the ability to flash graze temporarily inundated areas, particularly for vegetation enhancement reasons, just as they have done on the Duck Pond pastures. The periodicity of the flash grazing would depend upon conditions and would range from every 2-5 years. However, this band of temporarily inundated area is considered for purposes of this analysis as permanently converted.

North Barn

Proposed Project features near the North Barn will be concentrated on already developed areas such as the access road to the barn, but 1 acre of prime pasture will be converted to non-agricultural status as a result of the proposed Project.

Duck Club

The Project will convert approximately 1 acre of prime agricultural land with an estimated current productivity of 350-450 lbs./acre/month and 10 acres of non-prime agricultural land to non-agricultural use. This change will occur due to the re-excavation of historic Centerville Slough, and associated excavation and conversion of pasture to channel and aquatic habitat. The Project will also convert an additional acre of non-prime agricultural land to prime status through improved drainage and management activities.

However, the Project will also increase productivity on approximately 55 acres of this pasture as demonstrated in Table 3.2-4 and 3.2-5. Currently, acreage within the Russ Creek Avulsion Area (RCAA) shows a productivity rate near zero and is not prime. However, with improved management, that will change.

The Project proposes management that will increase the productivity of this area to at least 225/lbs/acre/month, and potentially as high as 600 lbs./acre/month making it both prime and very productive. Therefore, the Project will increase productivity on 4 acres in this pasture from no current productivity to 0.5 acres of prime status at a conservative estimate of at least 450 lbs/acre/month, and 3.5 acres of higher but not-prime status.

Western Pastures

The Project will impact approximately 7 acres of prime agricultural land with a current productivity level of approximately 350-450 lbs/acre/month through channel and side channel construction, converting that prime agricultural land to aquatic habitat. Of the 7 acres, 1.6 are at ~350 lbs/acre/month productivity, 3.2 acre from 450 lbs/acre/month productivity, and 2.2 are from 700 lbs/acre/month productivity. It should be noted that the primary purpose of this conversion is the improvement of drainage across the Project area via the reestablishment of conveyance infrastructure suitably sized for the drainage area, and capable of also providing significant habitat benefit. The Western Drainage Ditch (WDD) now serving the area has proven incapable of providing adequate drainage and has demonstrated a significant maintenance burden that would be alleviated by virtue of this proposed drainage feature.

One-hundred acres within the RCAA, which spans beyond the Western Pastures into other pastures, are not prime, and exhibit a productivity rate near zero. However, the management proposed by the Project will increase productivity on at least 28 acres of the RCAA to at least 700/lbs./acre/month, making it both prime and very productive.

Western 40

Due to the need to align Centerville Slough towards Angels Camp, a drainage and habitat improvement effort, and essentially a replacement of WDD, approximately two acres of prime pasture exhibiting current productivity levels of at least 750 lbs/acre/month will be impacted and permanently converted by the Project through channel construction.

100 acre Pasture

Six acres within the RCAA are not prime, and exhibit a productivity rate near zero. 42 acres of the pasture are of potentially prime status, but also suffer from avulsion events of the RCAA. The management proposed by the Project will increase productivity on these 42 acres from approximately 450-lbs/acre/month to approximately 700/lbs./acre/month, making it both predictably prime and increasingly productive. Therefore, the Project will increase productivity on 6 acres from extremely low and unpredictable productivity to a conservatively estimated 225 lbs./acre/month.

Quonset Hut

None of the Quonset Hut Pasture will be impacted by the Project.

Williams

None of the Williams Pasture will be impacted by the Project.

Russ Family: Pasture 1 (Angels Camp)

Few of the agricultural resources on this pasture will be impacted by the Project, as few persist following years of wave overwash events, inundations that have converted nearly 200 acres of prime farmland so far to tidal marsh. This pasture will be effectively abandoned for future

agricultural production with the exception of several acres that will be filled to create the berm, and therefore experience a minor improvement in productivity. However, the berm surrounding this area will function as a planned retreat strategy, protecting surrounding areas from further inundation, saltwater intrusion and other natural events that would diminish or eliminate in the future agricultural production as they have in Pasture 1.

Russ Family: Pasture 2 (Remainder of Russ Family Property)

As a result of creating the setback berm, approximately 6 acres of formerly inundated and non-agricultural land will be converted to prime agricultural land as a result of the Project. Channel construction will result in 2 acres of currently prime agricultural land being converted to non-agricultural use, though again this assumes that the drainage feature serving the agricultural property is a “non-agricultural use.” The net change for this pasture is a four acre increase in prime agricultural land.

Summary of Agricultural Land Conversion by Acreage

Changes in agricultural land use and conversion are organized in detail in Table 3.2-4 (change by productivity in acres), Table 3.2-5 (change in agricultural productivity status by pounds of dry matter) and Table 3.2-6 (Agricultural conversions in acres, pasture specific, in net values) Existing and proposed productivity levels are expressed graphically in Figures 3.2-8 and 3.2-9, respectively. Loss conversions are expressed in Table 3.2-6. Conversions are expressed in tabular form in Table 3.2-4. Thus, for land capable of producing 700 PDM, .5 acres of Russ and 3.5 acres of TWC will be converted to non-agricultural use for a total of four converted acres. Since 297 PDM is the cusp of prime status, Table 3.2-6 represents the total conversion of non-prime (120 acres) and prime agricultural (14 acres) to non-agricultural use.

Prospective Forage Production Increases

In addition to the conversion of some agricultural land to non-agricultural use, the Project will result in significant increases in productivity that exceed overall losses to conversion. These conversions of non-prime to prime agricultural land are widespread and significant. In fact, the proposed improvements to the Russ Creek Avulsion Area (RCAA) alone are capable of offsetting losses to prime and non-prime agricultural land elsewhere in the Project area.

The Project will provide durable improvements to the RCAA, a change that will boost productivity to levels well in excess of production levels lost through permanent conversions of primarily low productivity areas elsewhere. At present, the RCAA ranges annually from 80-150 acres in size, depending upon the storm event and season, and averages 115 acres. The RCAA may possess a dry matter productivity level of 200 lbs./acre/month, but even at that generous estimate it falls well below prime status. In contrast, the surrounding pastures are the most productive in the Project area, and possess dry matter productivity levels of at least 700 lbs./acre/month, well above prime status. Loamy and low salinity soil types, higher elevations and convenient access characterize the entire area, suggesting that, if managed similarly and predictably, free of unplanned avulsions and capable of acceptable drainage levels, the RCAA would meet or exceed the productivity levels of surrounding pastures, achieving prime status in the process. The proposed Project will increase the productivity in the RCAA by a reliable 500 lbs./acre/month. The analysis, however, makes the conservative assumption that the productivity will rise by a mere 125 pounds/acre, sufficient to convert the area to prime status. Based on this calculation, and the rate of conversion, the Project would result in a significant net increase in productivity annually, and an increase of prime agricultural land of 115 acres within the RCAA.

Prospective Livestock Productivity Gains

The best metric of success for the improvement of agricultural resources is the relative increase overall in Animal Unit Months (AUMs) that result from the Project. Evaluation of AUM gains or losses requires comparisons of pre and post Project conditions, and the factors that directly affect the agricultural productivity in the Project area. These factors include acreage in pasture, dry matter productivity, and, of course, Project impacts to forage productivity levels through either improvement to or conversions of agricultural land, prime or not. These factors are compared and calculated in order to assess the annual net change in productivity as measured in AUMs. Table 3.2-7, below illustrates a sample range of values evaluated in consideration of various Project scenarios. For example, if 75 acres of land capable of producing 350 pounds/acre is permanently converted, but 200 acres of unproductive land is enhanced to a similar level of productivity, then, according to the agricultural calculations used the Project yields a net annual benefit of 846 AUMs. Or, as more closely pertains to the Project, and as shown in the final line of Table 3.2-7, below, if 135 acres of land with a productivity level of 225 pounds/acre are converted, but 250 acres of land elsewhere is improved by at least 125 pounds/acre, the Project yields a net annual benefit of 17 AUMs.

Table 3.2-7 Agricultural Conversion Analysis Summary*

Dry Matter Productivity Range (Pounds/Acre/Month)	Ag Land Conversion Conversion Range (Acres)	Ag Land Improvement Range (Acres)	Annual Net Change (Aum)
0-50	1	350	337
50-100	25	300	532
100-225	50	250	871
225-350	75	200	846
350-450	100	150	435
450-700	125	100	-339
>700	150	50	-1,452
225(Loss)/125(gain)	**135**	**250**	**17**

*Assumed 20 pounds Dry Matter Intake (DMI) consumed per day

*Assumed 620 AUM as measured in pounds/month (20 DMI x 31 days)

The text highlighted in green (Table 3.2-7 above) most closely approximates the range of conversion and improvement most closely associated with the Project under this analytical approach. The Project would permanently convert approximately 134 acres of agricultural land in the Project area to other uses (14 prime, 120 non-prime). These impacts would occur as a result of various Project components, particularly the restoration of part of the Inner Marsh to a seasonally managed tidal marsh, the re-excavation of historic Centerville Slough and the associated drainage network, and various habitat enhancement measures, such as the restoration of riparian canopy along Russ Creek. These components are described in greater detail in the Project Description section.

Discussion

The premise of all analytical approaches is that if agricultural production levels on currently impaired areas can be improved by the Project and managed for more consistent agricultural production, and converted from non-prime to prime status, than those gains offset losses resulting elsewhere on the property due to Project components that result in the permanent conversion of agricultural land to other uses. This beneficial and upward conversion of productivity renders a net improvement to the Project area, and diminishes the impacts of proposed actions to a less than significant level.

The Project will provide two key agricultural benefits that provide overall increases in productivity to the Project area. These interrelated benefits are drainage improvements and productivity increases.

Overall drainage in the Project area will be improved and fortified in a mechanically feasible, cost-effective, procedurally reliable and legally defensible way for the future benefit of the Project area and surrounding properties that possess a drainage easement across the EREP.[8] One of the most significant benefits in this category will be the reestablishment of a Centerville Slough channel significantly larger than a maintained Western Drainage Ditch and capable of transporting water and sediment through the Project area and out towards the Eel River. Although the proposed Project may not rapidly increase the rate of drainage, it will ensure that there is drainage at all, a significant improvement over the existing condition of at least 200 acres in the southern Project area exposed to wave overwash with little outlet through a rapidly sanded in and difficult to operate and maintain Western Drainage Ditch.

Pasture productivity will increase and improve in reliability in various areas within the Project footprint. Approximately 7 acres on the western edge of the Western Pasture and the edge of Russ Pastures 1 and 2 will attain improved management of drainage through the area, and increased protection from wave breach events, avulsion events and deposits of large woody debris. This will be especially true to the degree that dune enhancement is successful as a Project component. It is expected that this improvement will result in a net increase of prime agricultural land from zero to 7 acres in that immediate area. More significantly, productivity will increase dramatically at the RCAA. This area has been documented to range annually from 80-150 acres in size, depending upon the storm event, level of sediment deposition and timing when the area dries, but averages 115 acres of disturbed area. As discussed, above, since pastures surrounding the RCAA are the most productive in the Project area, and possess dry matter productivity levels of at least 705 lbs/acre/month, possibly higher, it is reasonable to conclude that proper management of the RCAA will yield a comparable level of dry matter production. The proposed Project will therefore increase the productivity in the 115 acre avulsion area from ~200 lbs/acre/month to 705 lbs/acre/month, a firm increase of 505 lbs/acre/month. However, it is assumed for purposes of this analysis that the increase will only be 125 lbs/acre/month, still adequate within the confines of the RCAA to offset losses to prime and non-prime agricultural land elsewhere in the Project area. The increases in productivity on the RCAA will be demonstrated in the mitigation monitoring and reporting program.

Admittedly, this same improvement could be temporarily achieved through extensive tilling and re-seeding of the pasture to create a new seed bank. However, that effort would require at least one year of labor and a significant and risky investment of time and money given the continuing absence of a defined channel or even a salient plan for sediment management. Due to the

[8] The existing multi-party drainage easement enables property owners surrounding EREP to maintain existing drainage features to the extent allowable by law. However, historic maintenance practices appear to be both inadequate for the level of fresh and salt water input, costly and and procedurally challenging.

unpredictable nature of the avulsions, disturbance would occur again, likely annually, thereby destroying the effort to reclaim that pasture. For these reasons, a more durable management strategy for Russ Creek, particularly in relation to avulsion and sediment management, is desirable from an agricultural perspective if that area is to reach its full potential for production rates otherwise possible in those fertile parts of the Project area. In addition, that durable management strategy is capable of improving overall agricultural resources within and outside of the Project footprint.

Other Project Features

Other Project features will also help offset conversions of agricultural land within the Project area. First, agricultural utility of the Project area would be improved through road improvements and establishment of adequate turn-arounds near the Cut Off Slough tidegates. These improvements will facilitate maintenance and management of the Project area and associated infrastructure, particularly hydraulic components key to agricultural resources within and outside of the entire Project area. In addition, the construction of the berm surrounding Russ Pasture 1 (Angels Camp) will provide long-term protection in the near term to 450 remaining acres of productive prime farmland at risk of inundation from sea level rise, avulsions and other events under the No Project Alternative.

Finally, it is important to note that all of the prime acreage converted from “agricultural” to “non-agricultural” occurs as a result of excavating features that improve hydraulic conveyance. These new channels have a strong agricultural utility, and are arguably not true conversions of agricultural land, at least as considered in the context of their historic function and origin. Nonetheless, for purposes of this chapter, all changes from terrestrial to aquatic, even those that provide hydraulic conveyance capacity, are considered conversions of agricultural land.

In conclusion, agricultural operations on and outside of the Project area tend to operate on a narrow profit margin, and the risk inherent in operations is high. Thus, seemingly common-sense improvements to habitat and agricultural operations may be desirable, but they are not necessarily economically feasible. Moreover, the risk to agricultural operations in the Project area is increasing due to increased frequency of flood events, increasing numbers of wave breach events, sea level rise, and general deterioration of the Project area’s drainage network. Prospective investments in drainage, sediment management, protection from wave incursion and general agricultural improvements would go far to render the Project area far more agriculturally productive and economically stable and viable in the future.

These improvements require tradeoffs. For example, drainage channels can be improved and increased in size, but doing so necessitates the conversion of some acreage from pasture to channel. The only viable method of balancing impacts with benefits is by demonstrably improving agricultural productivity within the Project area.

The Project achieves the preservation and enhancement of agricultural resources through restoration of hydraulic and critical ecosystem functions. Objectives include repairing and improving the drainage network on the property; enhancing agricultural productivity in impacted areas; improving productivity on the RCAA; elevating targeted agricultural lands to increase resiliency to adverse impacts from sea level rise; improving the quality (composition) of agricultural lands; and decreasing onsite flooding and unpredictable sediment deposition on pastures. Most of the Project’s agricultural land is under Williamson Act Contract and is intended to remain under contract for the foreseeable future.

As discussed in Section 3.2-3, above, this EIR's significance threshold for conversion of prime farmland is any permanent net conversion of more than 2% of prime farmland within the entire Project area to non-agricultural use. As shown in Table 3.2-6, the conversion of prime agricultural land to non-agricultural use is 15.1 acres, or less than one percent of the Project area. However, the overall net increase in productivity results in a net increase of prime agricultural land of 3 acres, or approximately one-fifth of one percent of the Project area. For all of the aforementioned reasons, including efforts to avoid prime agricultural lands, and particularly due to the Project-related protections of and improvement to agricultural productivity as measured in TDM production and in AUMs, the Project impacts are found to be less than significant.

Mitigation Measures: No mitigation is necessary.

Monitoring Measure AR-1: Pasture Monitoring Plan

The Coastal Conservancy shall put in place a Pasture Monitoring Plan to monitor the increase in productivity resulting from the proposed Project for no fewer than five years. The Pasture Monitoring Plan will assess the Project's ability to provide a more predictable management of flow and sediment in the avulsion areas, and will quantify pasture production for the five-year period.

Additionally, the Coastal Conservancy shall place $90,000 into an escrow account, or otherwise cause such funds to be set aside, to be used only in the event that the Pasture Monitoring Plan shows that the projected productivity increases do not occur by the conclusion of the five-year monitoring period. The funds will be used to acquire or otherwise protect or improve agricultural land in or near the Project area for the benefit of the agricultural economy of Humboldt County. The fund amount is based on agricultural land in the Project area being worth an estimated $6,000/acre, and the potential conversion of prime agricultural land being 15 acres. If this outcome is triggered, the funds will be granted to a suitable non-profit or special district capable of and willing to administer the funds. Possible recipients include the Humboldt Resource Conservation District, the Salt River Watershed Council or the Northcoast Regional Land Trust.

Level of Significance: Less than significant

Impact AR-2: Conflict with existing zoning for agricultural use, or a Wiliamson Act contract.

The Project does not involve a change in zoning that would conflict with agricultural use or the existing Williamson Act contract for the EREP. The Humboldt County 1983 General Plan, 2008 Draft General Plan land use designation of the Project area, and the Eel River Area Plan LCP land use designation of the Project area (Agricultural Exclusive), preserve the land for agricultural purposes, but allow wetland restoration and fish and wildlife management as conditional uses. Project site zoning is also Agricultural Exclusive, which is consistent with the land use designation. Therefore, the proposed Project is compatible with existing zoning. A conditional use permit would be sought from the County as part of the Project.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact AR-3: Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use.

Aside from the direct conversion of some farmlands to tidal marsh, open water, riparian habitats or setback berms, discussed above in Impact AR-1, the Project is not expected to result in any changes in the existing environment that would result in the conversion of farmland to non-

agricultural use. Rather, the Project would result in a neutral or beneficial effect on agricultural productivity due to decreased frequency and duration of inundation and other Project components, as discussed above in Impact AR-1. Furthermore, extensive input on the Project design has been solicited from adjacent landowners throughout the Project development. Input from adjacent landowners resulted in some of those landowners recognizing the beneficial effects of the Project on agricultural productivity, and aided in developing appropriate configurations to achieve optimal balance between resource effects and benefits and to avoid or minimize the Project's impacts on agriculture.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.2.6 Cumulative Impacts

Impact CR-C-1: Cumulative Impacts to Agricultural Resources.

There are agricultural resources that would be impacted by the Project. There are also projects underway in the Eel River Delta that individually and collectively have a comparable potential to impact and benefit agricultural resources. These include the Salt River Ecoystem Restoration Project, the Ocean Ranch Project, and multiple projects underway by the NRCS and U.S. Fish and Wildlife Service (USFWS –Partners Program).[9] Most of these projects share the common goal of restoring habitat while improving drainage on agricultural properties in the area. As described in this EIR, appropriate studies were undertaken to ensure that agricultural resources that could be impacted by the Project were identified, and that avoidance or offsetting measures reduce the impacts of the Project to known agricultural resources to a less-than-significant level. These measures are consistent with Humboldt County General Plan Policies and Public Resources Code § 30241. Therefore, the Project's incremental effect to agricultural resources is not cumulatively considerable and would not contribute to any significant impacts to agricultural resources that may be caused by other cumulative Projects. The Project may provide an incremental benefit to the Salt River Ecosystem Restoration Project, in that the increase in post-Project tidal prism and flow energy through lower Cut-Off Slough and Salt River will increase the sediment transport capacity through downstream reaches of the Salt River. This change will enhance and better sustain a primary objective of enhanced sediment transport for the Salt River Ecosystem Restoration Project. Enhanced water and sediment flow through the downstream reaches will also better maintain the restoration efforts associated with the Eel River Estuary and Centerville Slough Enhancement Project.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

[9] Details regarding NRCS projects are withheld by NRCS in the interest of protecting and enhancing relations with project partners. However, NRCS and USFWS have been kept fully informed of this project development, and have been asked to notify the SCC, CalTrout or their consultants if any project elements appear to pose adverse affects to agricultural resources in the project area, either individually or cumulatively.

3.2.7 References

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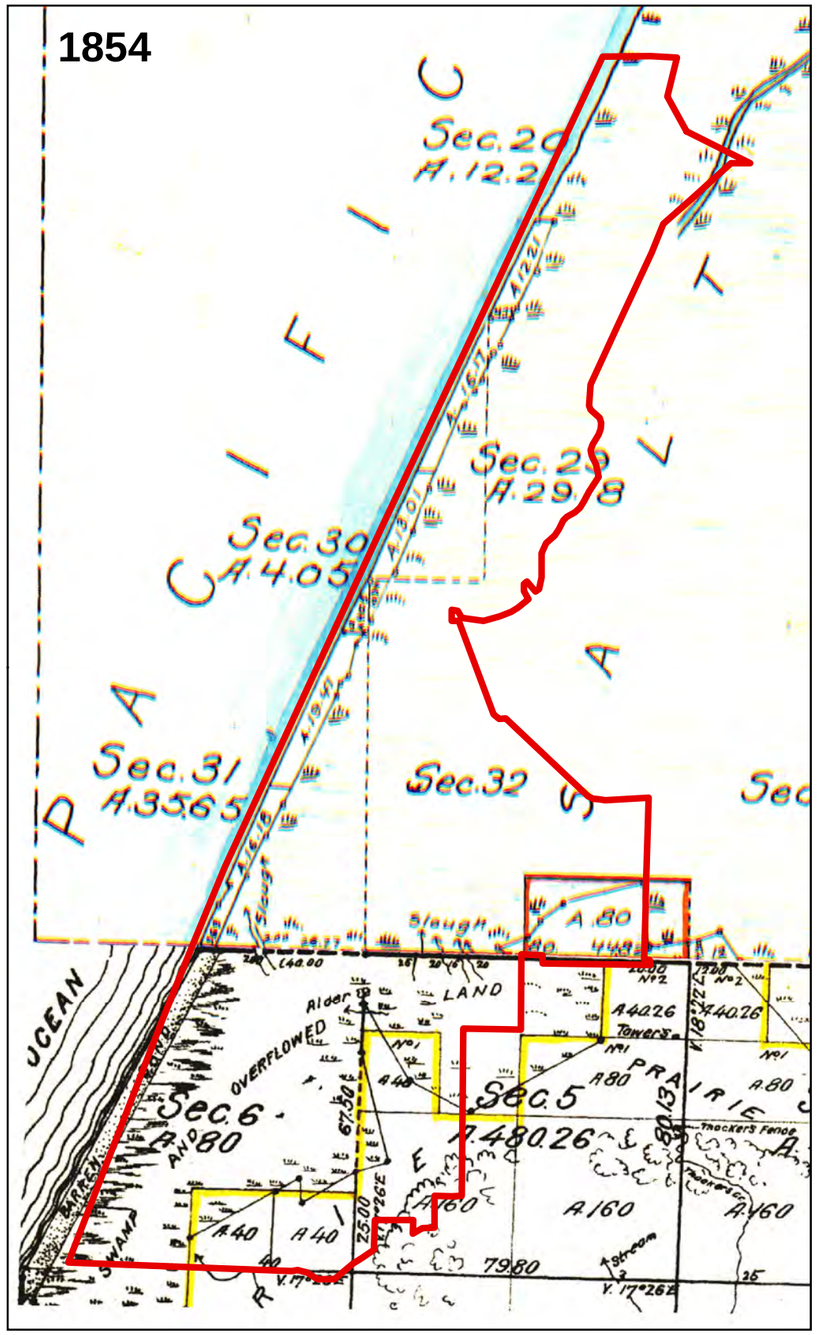

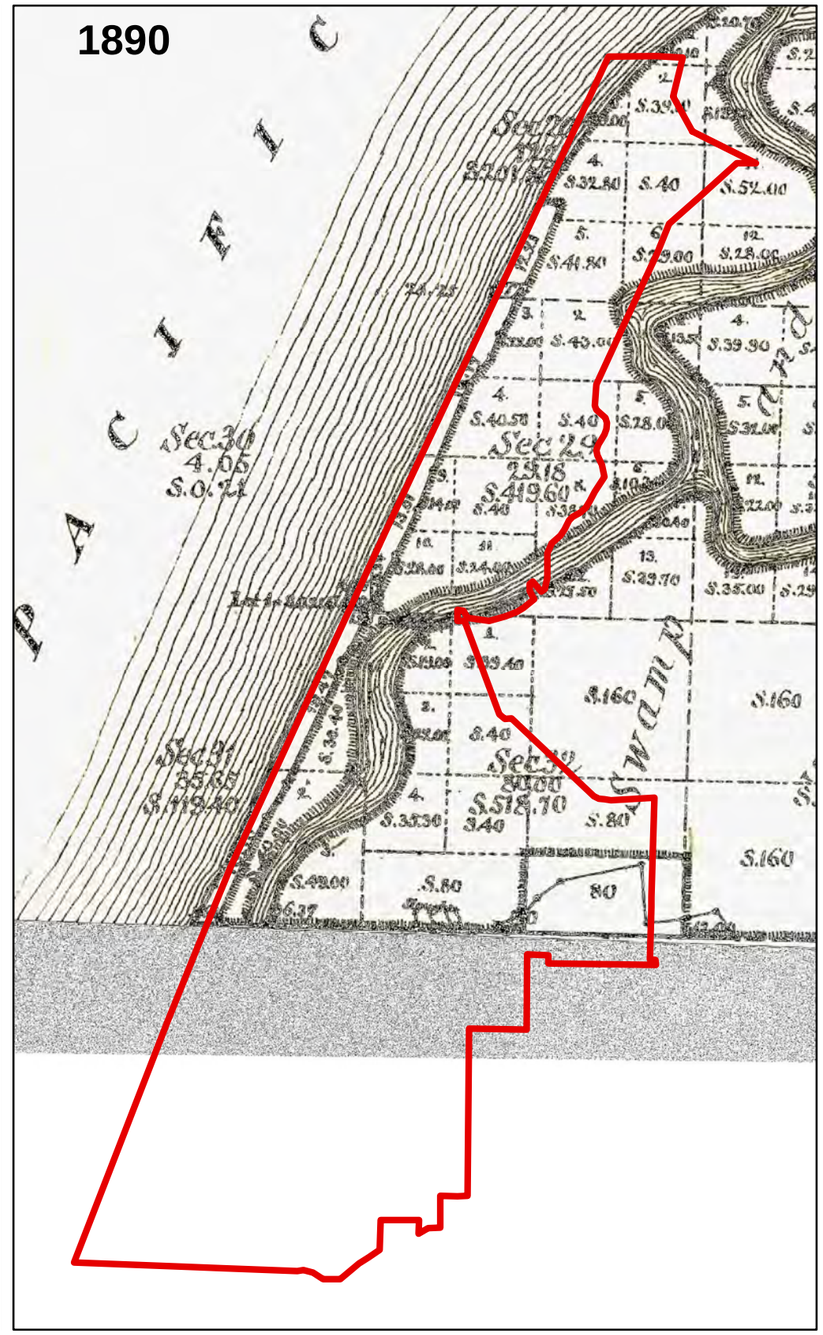

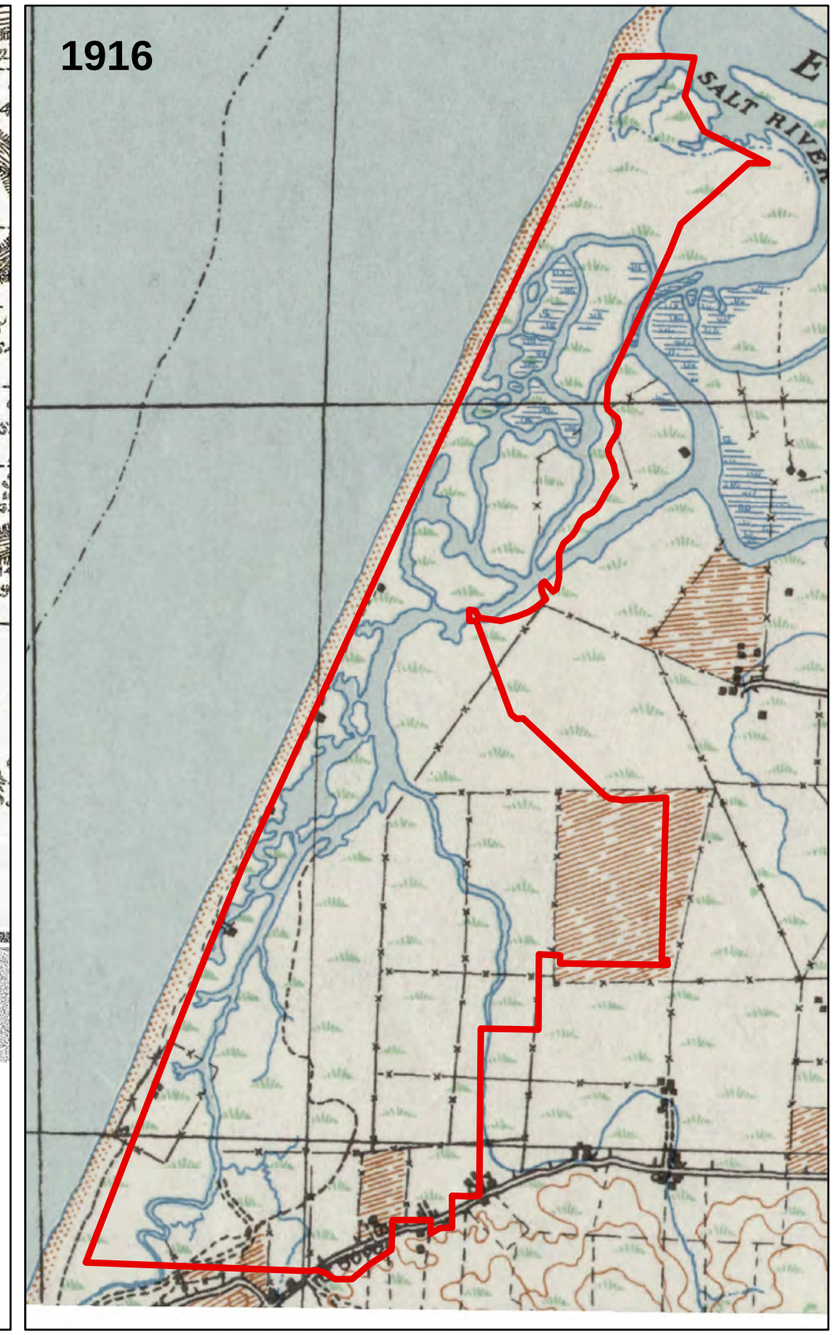

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Project Boundary

Eel River Estuary and Centerville Slough Enhancement Project

Job Number	8410882
Revision	A
Date	16 Jun 2016

Agricultural Resources Historical Maps

Figure 3.2-1

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Data source: State Lands Map, 1890; USACE Tactical Map, 1916. Created by:JClark2

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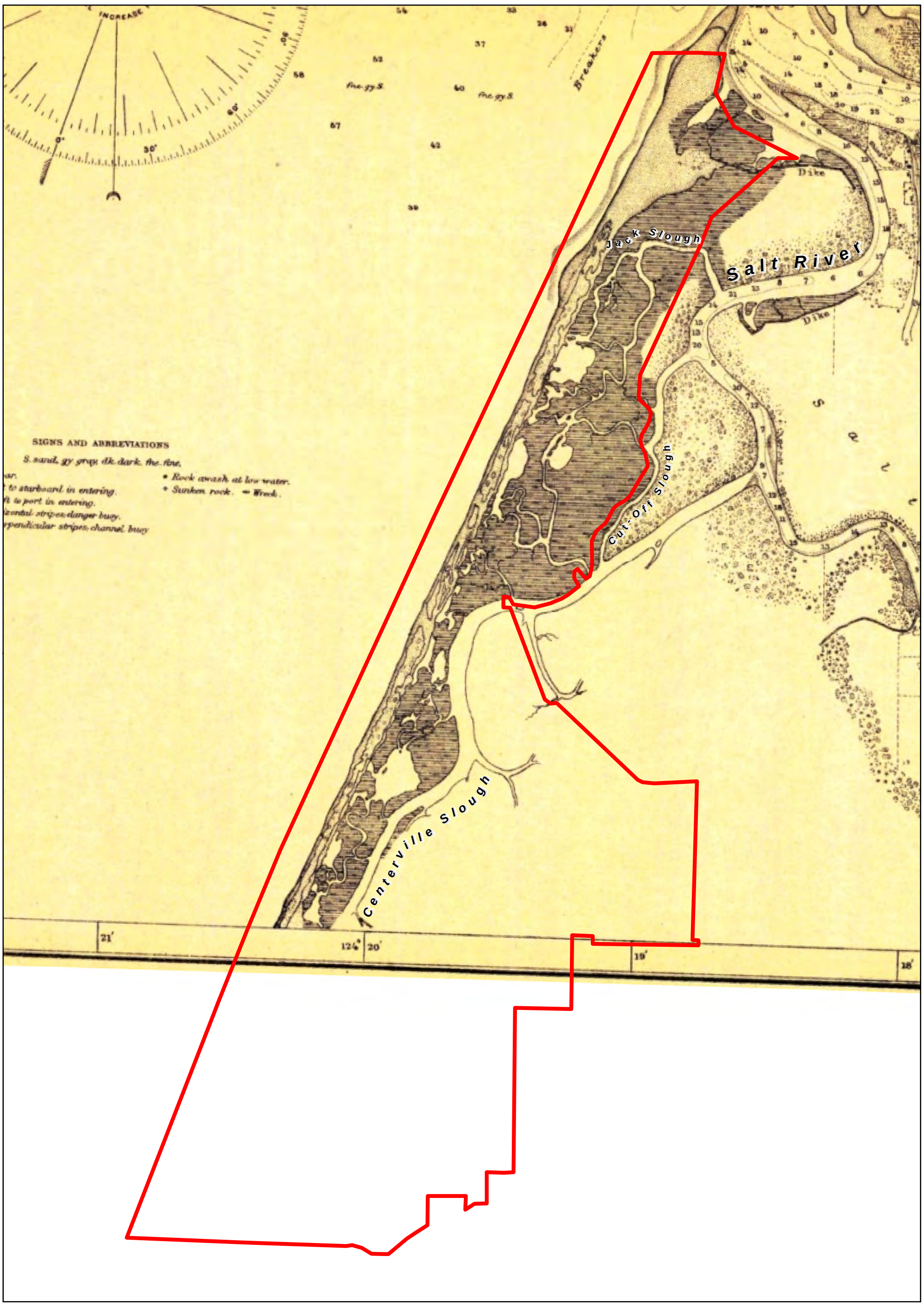

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 16 Jun 2016

Agricultural Resources 1889 Navigation Map

Figure 3.2-2

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Eel River Estuary and Centerville Slough Enhancement Project

Agricultural Resources
Current Project Aerial

Job Number	8410882
Revision	A
Date	16 Jun 2016

Figure 3.2-3

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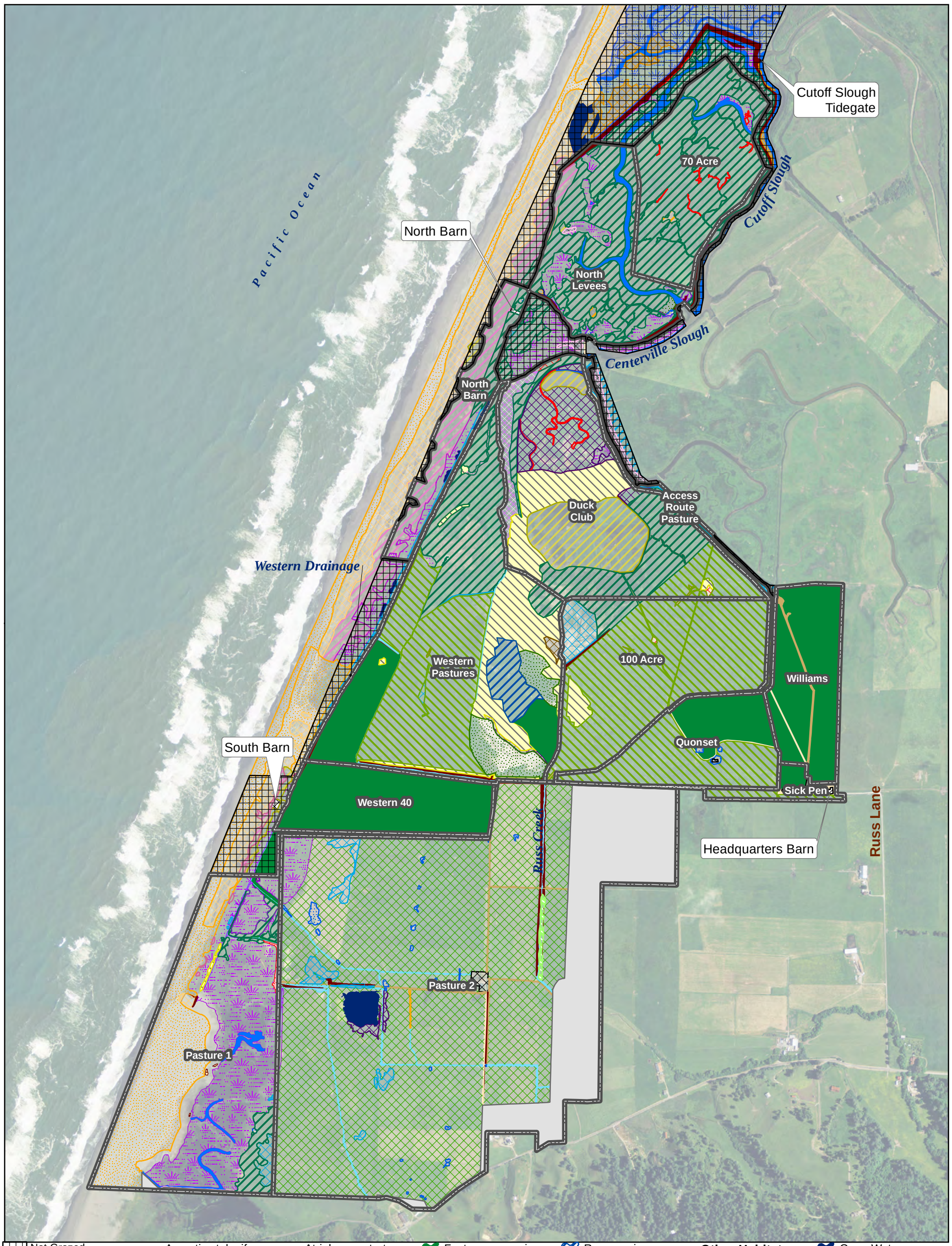

Not Grazed
Pastures

Vegetation Alliance

- Abronia latifolia - Ambrosia chamissonis
- Agrostis stolonifera
- Agrostis stolonifera - Potentilla anserina
- Agrostis stolonifera - Distichlis spicata
- Alnus rubra - Salix hookeriana
- Ammophila arenaria
- Atriplex prostrata- Cotula coronopifolia
- Bolboschoenus maritimus
- Distichlis spicata
- Eleocharis macrostachya
- Festuca perennis
- Holcus lanatus
- Juncus breweri
- Juncus effusus
- Juncus lescurii
- Potentilla anserina ssp. pacific
- Rumex crispus
- Salix hookeriana
- Schoenoplectus pungens
- Spartina densiflora Complex

Other Habitat

- Bare Ground
- Beach
- Development
- Ditch
- Improved Road
- Managed Pasture
- Open Water
- Other Invasive
- Sarcocornia pacifica
- Sarcocornia pacifica Complex
- Slough
- Unimproved Road
- Unmapped
- Upland Ruderal

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Eel River Estuary and Centerville Slough Enhancement Project

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Revision A
Date 16 Jun 2016

Agricultural Resources Vegetation Detail Map

Figure 3.2-4

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Data source: Habitat Mapping, GHD, 2013, J.B. Lovelace & Associates, 2011, and Humboldt Bay Harbor District Preliminary Spartina Mapping, 2013; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:JClark2

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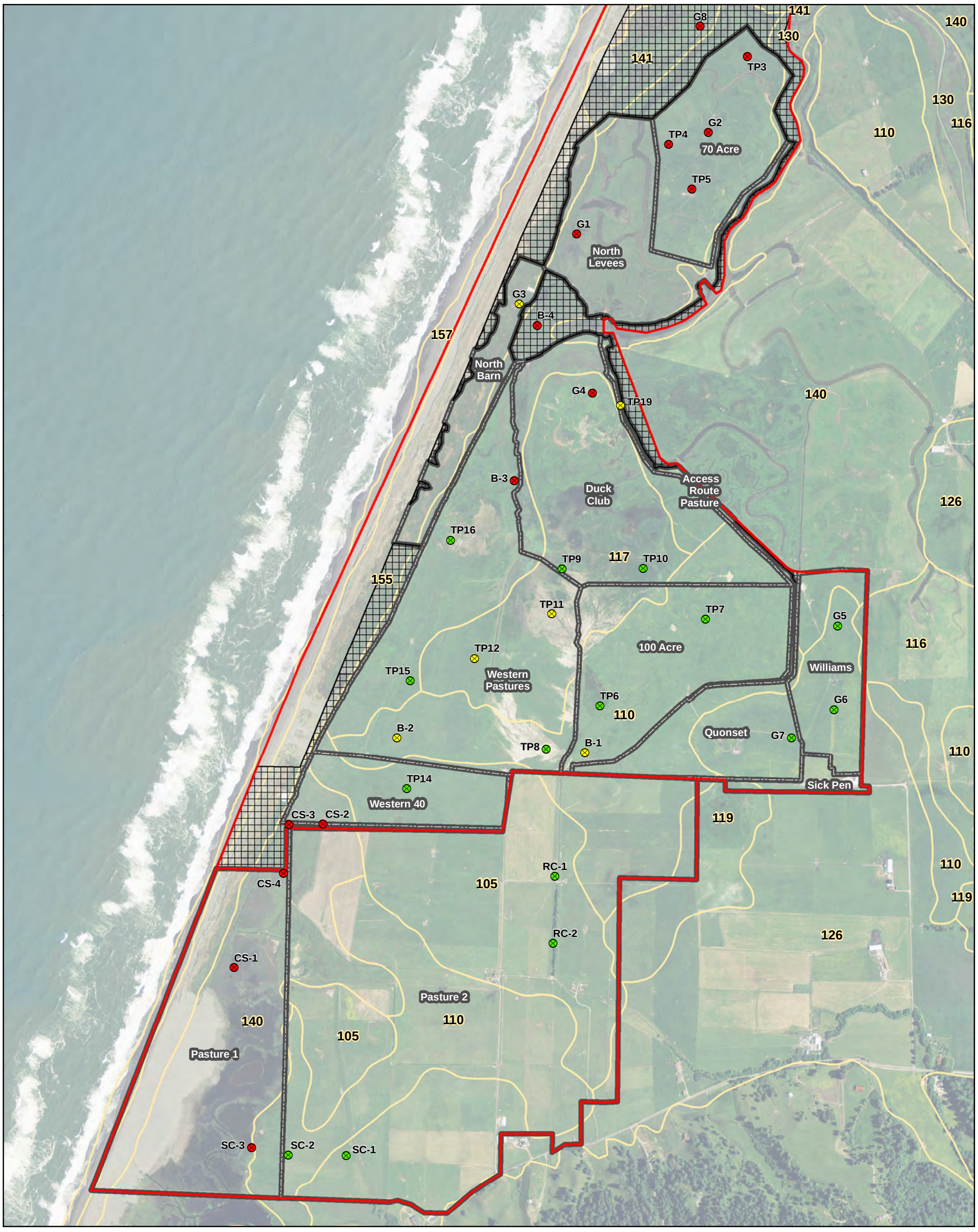

Sampling Locations

- Non-saline
- Saline
- Saline-sodic
- Pastures
- Not Grazed
- Project Boundary

Map Unit Symbol	Map Unit Name	Map Unit Symbol	Map Unit Name	Map Unit Symbol	Map Unit Name
103	Fluvaquentic Endoaquolls, 0 to 2 percent slopes	131	Fluvaquents, 0 to 2 percent slopes	157	Beaches-Samoa-Dune land complex, 0 to 50 percent slopes
105	Worswick, 0 to 2 percent slopes	132	Udifluvents, 0 to 2 percent slopes	195	Russ, 0 to 2 percent slopes
110	Weott, 0 to 2 percent slopes	133	Arlynda, 0 to 9 percent slopes	196	Madriver, 0 to 2 percent slopes
116	Swainslough, 0 to 2 percent slopes	140	Occidental, 0 to 2 percent slopes	201	Grizzlybluff, 0 to 2 percent slopes
117	Swainslough-Occidental complex, 0 to 2 percent slopes	141	Wigi complex, 0 to 2 percent slopes	210	Dungan, 0 to 2 percent slopes
119	Arlynda, 0 to 2 percent slopes	142	Wigi, 0 to 2 percent slopes	211	Barbercreek, 2 to 5 percent slopes
126	Loleta, 2 to 5 percent slopes	155	Samoa-Clambeach-Dune land complex, 0 to 50 percent slopes	220	Ferndale, 0 to 2 percent slopes
127	Jollygiant, 0 to 2 percent slopes	156	Lanphere, 2 to 75 percent slopes	221	Canalschool, 0 to 2 percent slopes
130	Fluvaquents-Riverwash complex, 0 to 2 percent slopes				

Soil Map Unit (USDA Natural Resources Conservation Service)

SALINE: Soils with an EC value greater than 4 dS/m, but an ESP value less than 15 and a SAR value less than 13 are generally classified as saline soils.

SALINE SODIC: Soils with an EC value greater than 4 dS/m, and an ESP value greater than 15 or SAR value greater than 13 are classified as saline-sodic soils.

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 16 Jun 2016

Agricultural Resources
Soil Salinity Sampling Locations

Figure 3.2-5

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Data source: Wetland Mapping, GHD, 2013, and Mad River Biologists, 2011; Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:JClark2

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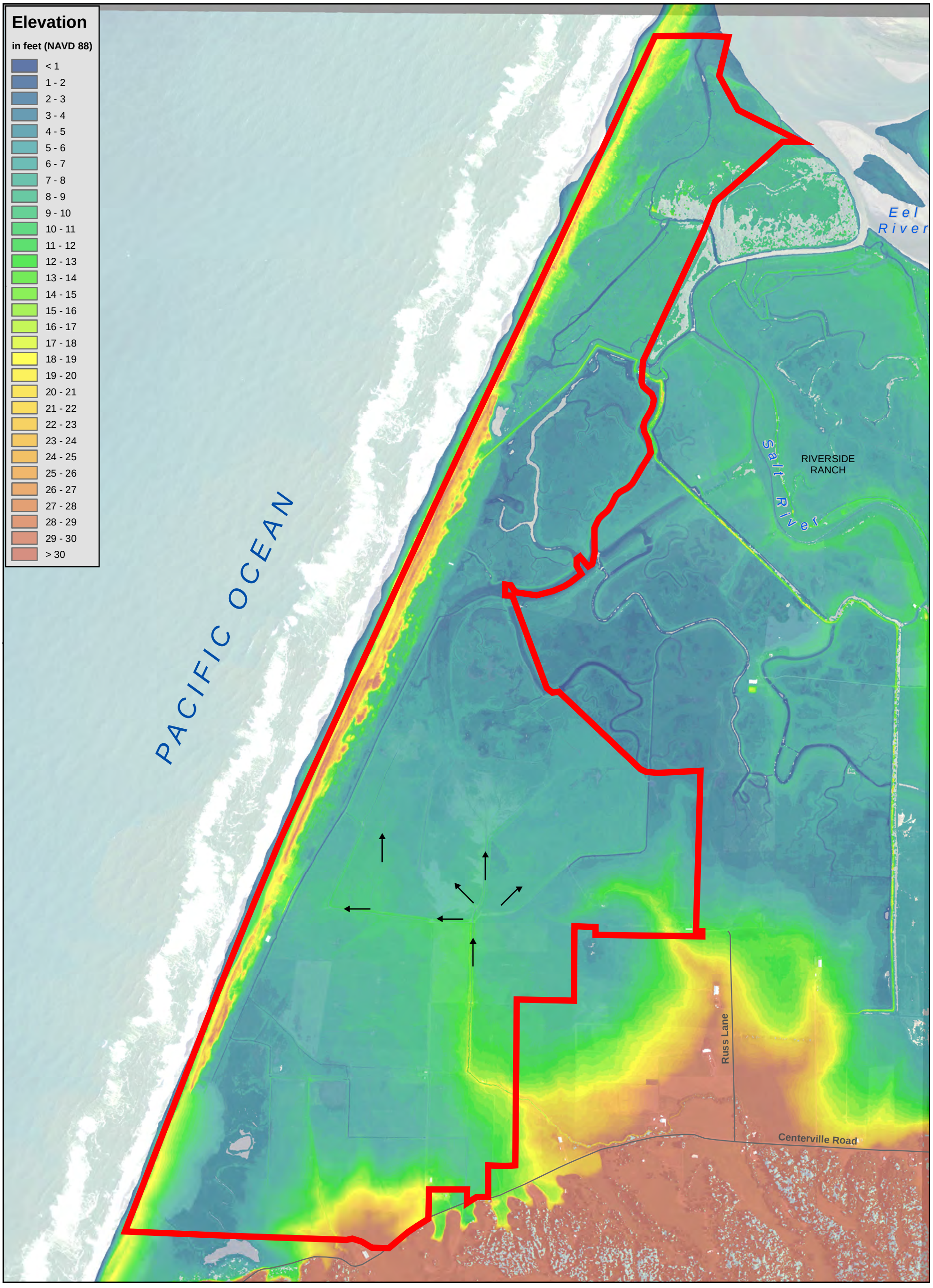

Project Area

Local Roads

Avulsion Direction

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Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 16 Jun 2016

Agricultural Resources Elevation

Figure 3.2-6

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Data source: NOAA Lidar DEM, 2012. Created by:JClark2

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Project Boundary

Property Boundary (Reference: Humboldt County Parcel Data)

Proposed Wetland Reserve Easement and Williamson Act

Williamson Act

AE-60/W,F,R,T

AE-60/W,F,R,T;NR/R

AE: Agriculture Exclusive
W: Wetland
F: Flood
R: Riparian
T: Transitional Agricultural Lands
NR/R: Natural Resources with Riparian Protection

Paper Size 8.5" x 11" (ANSI A)

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882.03
Revision A
Date 16 Jun 2016

Agricultural Resources
Williamson Act Properties

Figure 3.2-7

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Data source: Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:JClark2

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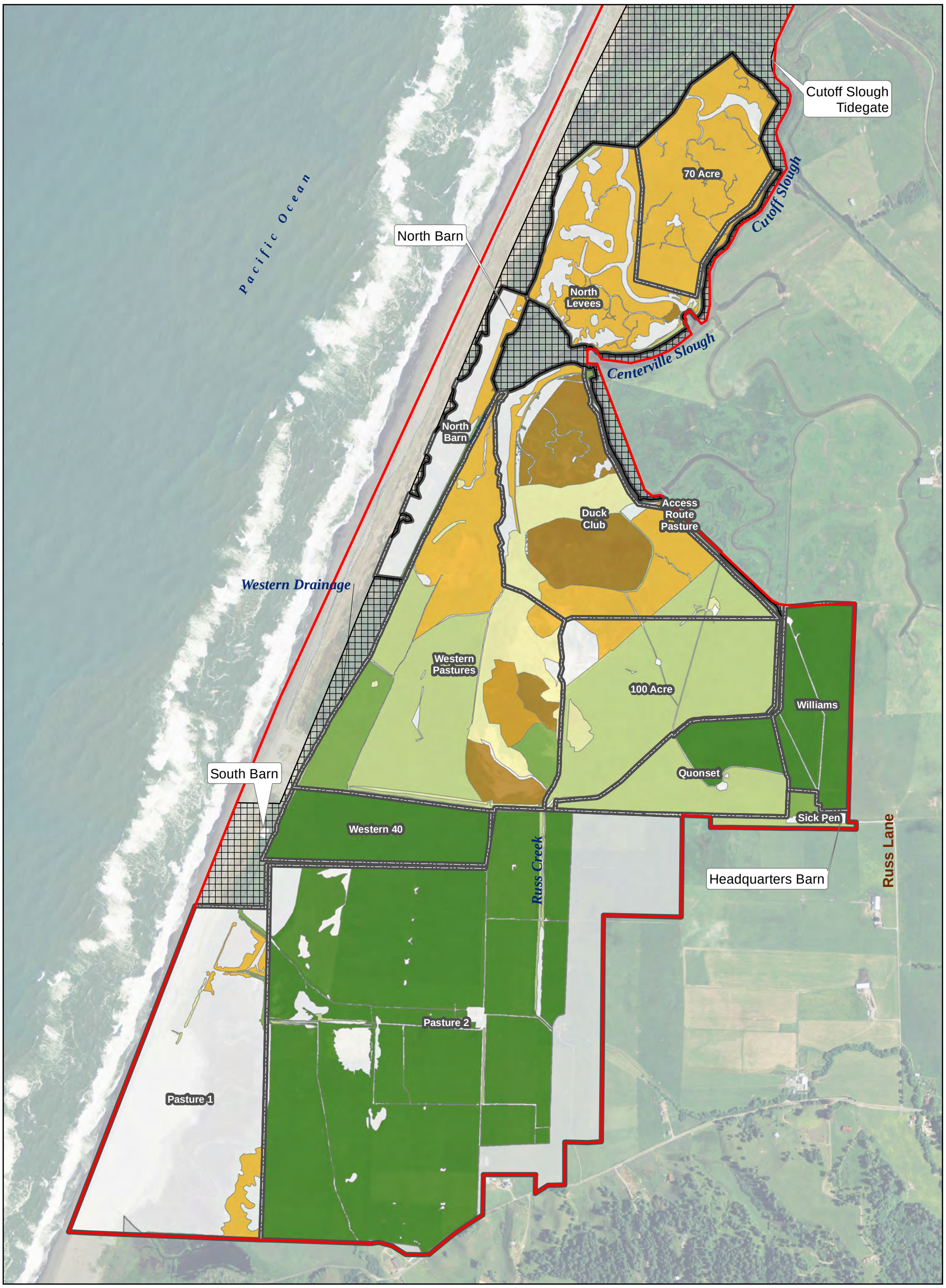

Project Boundary
Pastures
Not Grazed

Monthly Productivity (lbs/acre)

null | 0 | 50 | 100 | 225 | 350 | 450 | 700 | 750

Paper Size 11" x 17" (ANSI B)

0 250 500 1,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 06 Jul 2016

Agricultural Resources Existing Productivity Rates

Figure 3.2-8

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Data source: Habitat Mapping, GHD, 2013, J.B. Lovelace & Associates, 2011, and Humboldt Bay Harbor District Preliminary Spartina Mapping, 2013; Parcel Lines, Humboldt County, v51, 2015; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:JClark2

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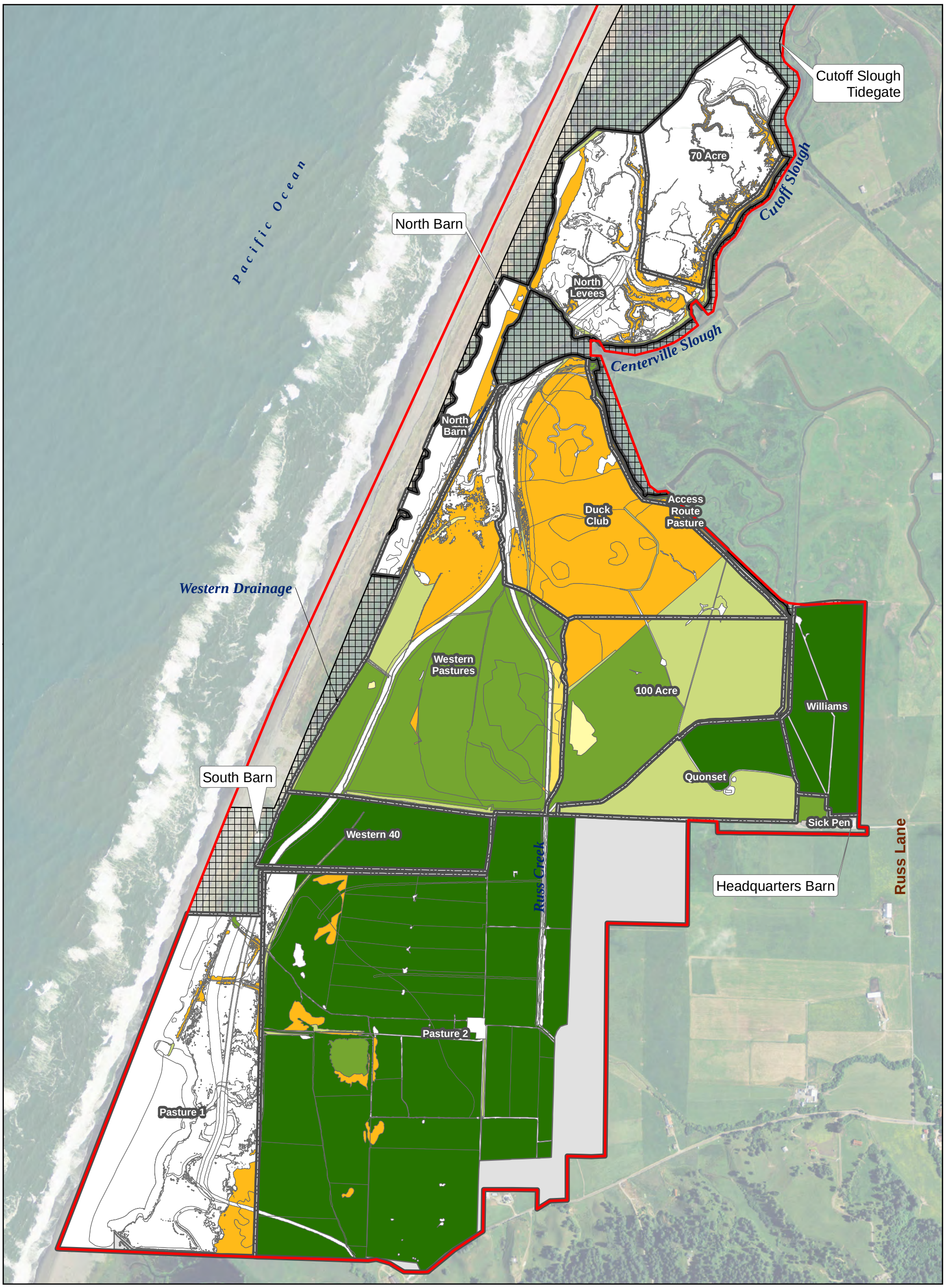

Project Boundary
Pastures
Not Grazed

Monthly Productivity (lbs/acre)

null | 0 | 225 | 300 | 350 | 450 | 700 | 750

Paper Size 11" x 17" (ANSI B)

0 250 500 1,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision B
Date 31 Aug 2016

Agricultural Resources
Proposed Productivity Rates

Figure 3.2-9

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Data source: Habitat Mapping, GHD, 2013, J.B. Lovelace & Associates, 2011, and Humboldt Bay Harbor District Preliminary Spartina Mapping, 2013; Parcel Lines, Humboldt County, v51, 2015; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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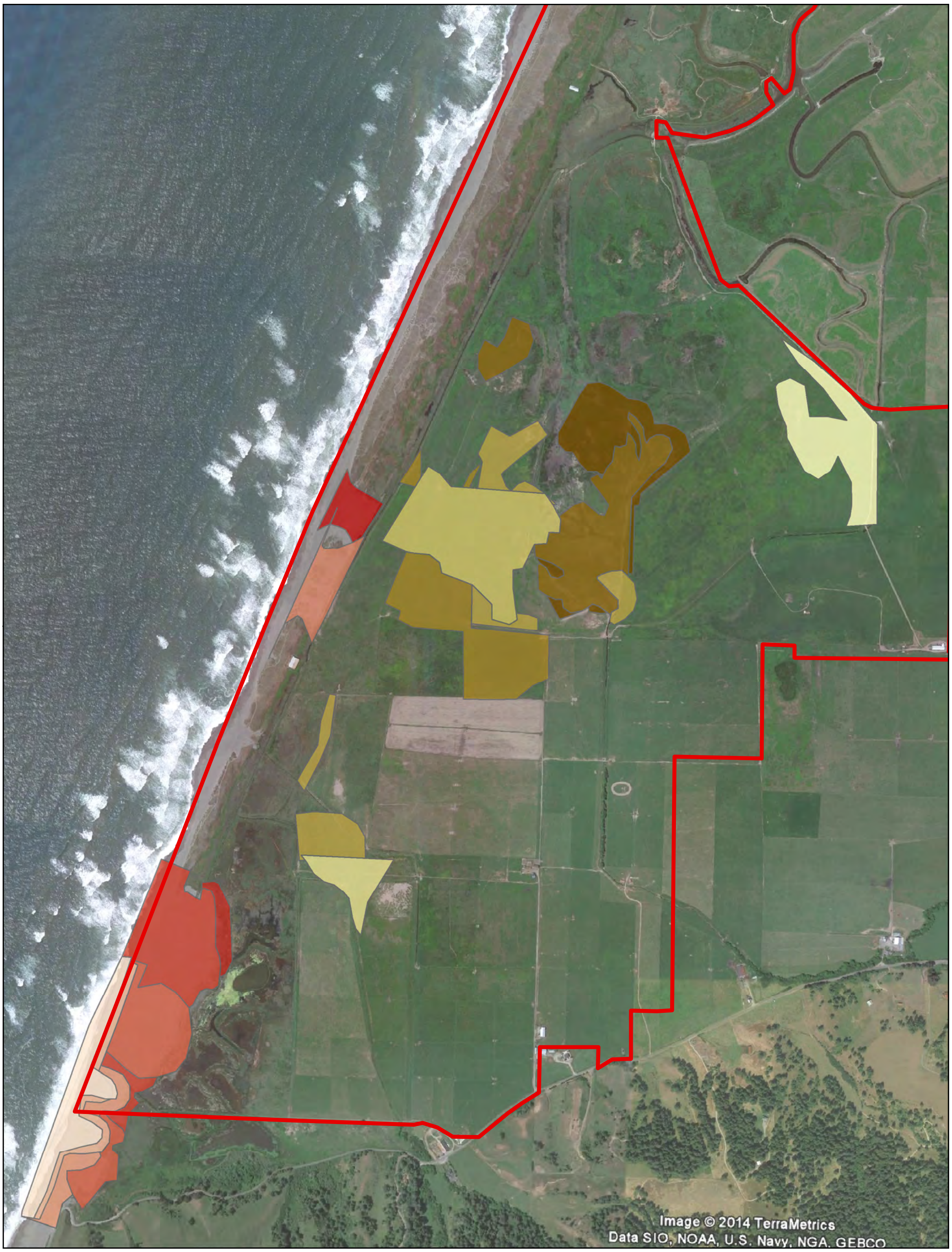

Project Boundary

Sand Dune Blowout Migration

- 1963 (16.11 acres)
- 1986 (4.04 acres)
- 1998 (21.65 acres)
- 2005 (27.37 acres)
- 2005-2010 (8.75 acres)
- 2009 (50.60 acres)
- 2010 (77.53 acres)
- 2012 (81.00 acres)
- 2012-2013 (5.90 acres)

Russ Creek Avulsion Migration

- 1948 (23.36 acres)
- 1963 (7.74 acres)
- 1968 (36.89 acres)
- 1986 (40.92 acres)
- 1998 (39.77 acres)
- 2005 (37.18 acres)
- 2012 (38.30 acres)

Paper Size ANSI B

0 500 1,000 2,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 84-10882
Revision A
Date 16 Jun 2016

Agricultural Resources
Dune Overwash and Avulsion Areas

Figure 3.2-10

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Data source: Google Earth Aerial, 2014. Created by:JClark2

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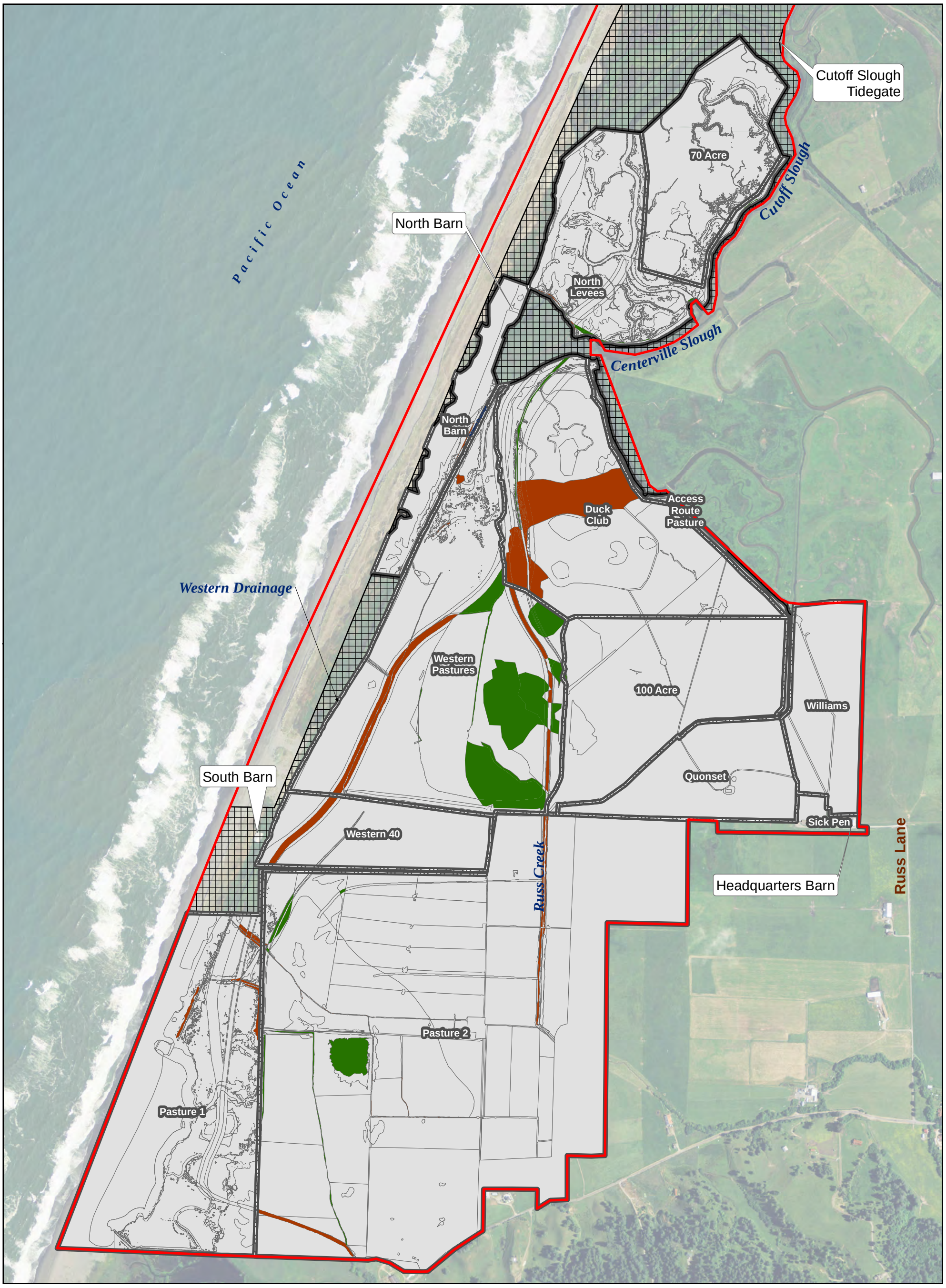

Project Boundary
Pastures
Not Grazed
Non-Ag or Not Prime to Prime
Prime to Non-Ag or Not Prime
No Change in Prime Status

Paper Size 11" x 17" (ANSI B)

0 250 500 1,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Agricultural Resources
Change in Prime Agriculture

Job Number 8410882
Revision B
Date 31 Aug 2016

Figure 3.2-11

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Data source: Habitat Mapping, GHD, 2013, J.B. Lovelace & Associates, 2011, and Humboldt Bay Harbor District Preliminary Spartina Mapping, 2013; Parcel Lines, Humboldt County, v51, 2015; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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3.3 Air Quality

This section includes a summary of applicable regulations, existing air quality conditions and an analysis of potential impacts related to air quality during construction and operation of the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential air quality impacts, identifies the significance of impacts, and where appropriate, presents mitigation to reduce impacts to less-than-significant levels.

3.3.1 Setting

North Coast Air Basin

The Project site is located in Humboldt County in the North Coast Air Basin, which is comprised of Del Norte, Humboldt, Mendocino, and Trinity Counties as well as the northern and western portion of Sonoma County (as defined by the California Code of Regulations). The local climates, or sub-climates, within the North Coast Air Basin are affected by elevation and proximity to the Pacific Ocean. Humboldt County, like the North Coast Air Basin, contains sub-climates that are created by local topography and proximity to the ocean. The Project site is located in the Eel River Delta Area.

Climate

The Project area is influenced by coastal fog throughout the year and, along with the rest of the Eel River Delta, is one of the cloudiest areas in the country (Stokes 1981). Precipitation is seasonal, and averages 48.5 inches of precipitation annually, with 90 percent of the annual precipitation occurring between October and April. Temperatures are moderate and show little fluctuation annually. Summers are cool, with normal highs in the 60s, and dry. Morning fog is common. Winters are mild and rainy, with normal highs in the 50s. Freezing temperatures are rare.

Humboldt County, like the North Coast Air Basin, contains sub-climates that are created by local topography and proximity to the ocean. The Project site is located within the Eel River delta. Weather in the Eel River delta is subject to cold upwelling of sea water to the ocean surface off the Humboldt Coast. This cold sea water in turn cools the surface air. During the summer, winds flowing from the Pacific Ocean are drawn on shore by the difference in surface temperatures, resulting in daytime northwesterly winds. In winter, this temperature differential is less, and surface winds may blow from many directions depending on storm patterns or periods of calm. These periods of calm can amount to 30 percent of the year (City of Fortuna 2009). Wind helps disperse air pollution, while calm periods allow it to increase to potentially unhealthy levels. Temperature inversions, which occur when a higher layer of warm air traps cool air near the surface, inhibit the vertical dispersion of air pollution. Inversions occur most commonly in the area during winter months and trap emissions of all types near the surface (City of Arcata 2006). Dispersion usually occurs when a frontal system, often accompanied by strong winds, passes over the area disturbing the temperature inversion, which allows pollutants to disperse vertically and horizontally.

Sensitive Receptors

Sensitive receptors are people who are particularly susceptible to the adverse effects of air pollution. The California Air Resources Board (CARB) has identified the following people who are most likely to be affected by air pollution: children, the elderly, the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases. Residential areas are also considered sensitive receptors to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Agricultural areas are less sensitive to poor air quality because population density is low. The Project site is

located in an undeveloped, agricultural area. The closest schools to the Project area are in Ferndale, approximately four miles to the west. Ferndale is also the closest significant residential area to the Project site. There are no residential communities near the Project site, although scattered rural residences and farms are located in the Project vicinity.

Existing Air Quality – Criteria Air Pollutants

California and the federal government (i.e., U.S. Environmental Protection Agency [EPA]) have established ambient air quality standards for several different pollutants. Most standards have been set to protect public health, but standards for some pollutants have other purposes, such as to protect crops, protect materials, or avoid nuisance conditions. Table 3.3-1 summarizes state and federal ambient air quality standards.

Table 3.3-1 Relevant California and National Ambient Air Quality Standards and Attainment Status

Pollutant	Averaging Time	California Standards	North Coast Air Basin Status	National Standards	North Coast Air Basin Status
Ozone	8-hour	0.070 ppm (137 µg/m^3)	Attainment	0.075 ppm (147µg/m^3)	Unclassified/ Attainment
	1-hour	0.09 ppm (180 µg/m^3)	Attainment	None	NA
Carbon Monoxide	1-hour	20 ppm (23 mg/m^3)	Attainment	35 ppm (40 mg/m^3)	Unclassified/ Attainment
	8-hour	9.0 ppm (10 mg/m^3)	Attainment	9 ppm (10 mg/m^3)	
Nitrogen Dioxide	1-hour	0.18 ppm (339 µg/m^3)	Attainment	0.100 ppm (188 µg/m^3)	Unclassified/ Attainment
	Annual	0.030 ppm (57 µg/m^3)	Status not reported	0.053 ppm (100 µg/m^3)	
Sulfur Dioxide	1-hour	0.25 ppm (655 µg/m^3)	Attainment	0.075 ppm (196 µg/m^3)	Unclassified
	24-hour	0.04 ppm (105 µg/m^3)	Attainment	0.14 ppm (365 µg/m^3)	
	Annual	None	NA	0.03 ppm (56 µg/m^3)	
Respirable Particulate Matter (PM_{10})	24-hour	50 µg/m^3	Nonattainment	150 µg/m^3	Unclassified
	Annual	20 µg/m^3	Nonattainment	None	
Fine Particulate Matter ($PM_{2.5}$)	24-hour	None	NA	35 µg/m^3	Unclassified/ Attainment
	Annual	12 µg/m3	Attainment	12 µg/m3	

Source: CARB (2013 and 2015)

Notes:
ppm = parts per million
mg/m3 = milligrams per cubic meter
µg/m3 = micrograms per cubic meter

Of pollutants that may be generated by the proposed Project, those of greatest concern are emitted by motor vehicles. These pollutants include fine particulate matter (PM) less than 2.5 microns in diameter ($PM_{2.5}$) and particulate matter less than 10 microns in diameter (PM_{10}). Other pollutants

that are less problematic to the region include ozone precursors (nitrogen oxides [NO_X] and reactive organic gases [ROG]) and carbon monoxide.

Particulate Matter

Particulate matter is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size, and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. Particles 10 microns or less in diameter are defined as "respirable particulate matter" or "PM_{10}." Fine particles are 2.5 microns or less in diameter ($PM_{2.5}$) and, while also respirable, can contribute significantly to regional haze and reduction of visibility. Inhalable particulates come from smoke, dust, aerosols, and metallic oxides. Although particulates are found naturally in the air, most particulate matter found in the Project vicinity is emitted either directly or indirectly by motor vehicles, agricultural activities, and wind erosion of disturbed areas. Most $PM_{2.5}$ is comprised of combustion products such as smoke. Extended exposure to PM can increase the risk of chronic respiratory disease (BAAQMD 2011a). PM exposure is also associated with increased risk of premature deaths, especially in the elderly and people with pre-existing cardiopulmonary disease. In June 2002, the CARB adopted new ambient air quality standards for PM_{10} and $PM_{2.5}$, resulting from an extensive review of the health-based scientific literature. The U.S. EPA adopted a more stringent 24-hour $PM_{2.5}$ standard of 35 micrograms per cubic meter ($\mu g/m^3$) in September 2006, replacing the older standard of 65 $\mu g/m^3$ (BAAQMD 2011b).

Ozone

Ground-level ozone is the principal component of smog. Ozone is not directly emitted into the atmosphere, but instead forms through a photochemical reaction of reactive organic gases (ROG) and nitrogen oxides, which are known as ozone precursors. Ozone levels are highest from late spring through autumn when precursor emissions are high and meteorological conditions are warm and stagnant. Motor vehicles create the majority of ROG and NO_X emissions in California. Exposure to levels of ozone above current ambient air quality standards can lead to human health effects such as lung inflammation and tissue damage and impaired lung function. Ozone exposure is also associated with symptoms such as coughing, chest tightness, shortness of breath, and the worsening of asthma symptoms (BAAQMD 2011a). The greatest risk for harmful health effects belongs to outdoor workers, athletes, children, and others who spend greater amounts of time outdoors during periods of high ozone levels.

Carbon Monoxide

Carbon monoxide, known as CO, is a public health concern because it combines readily with hemoglobin in the bloodstream, reducing the amount of oxygen transported by blood. State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 parts per million (ppm) by volume, and the federal 1-hour standard is 35 ppm. Both the state and federal standards are 9 ppm for the 8-hour averaging period. Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter, when light winds combine with ground-level temperature inversions (typically between evening and early morning). These conditions result in reduced dispersion of vehicle emissions. Also, motor vehicles emit CO at higher rates when air temperatures are low.

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an essential ingredient in the formation of ground-level ozone pollution. NO_2 is one of the nitrogen oxides (NO_X) emitted from high-temperature combustion processes, such as those occurring in trucks, cars, and power plants. Home heaters and gas stoves also produce NO_2 in indoor settings. Besides causing adverse health effects, NO_2 is responsible for the

visibility reducing reddish-brown tinge seen in smoggy air in California. NO_2 is a reactive, oxidizing gas capable of damaging cells lining the respiratory tract. Studies suggest that NO_2 exposure can increase the risk of acute and chronic respiratory disease (BAAQMD 2011). Due to potential health effects at or near the current air quality standard, the CARB recently revised the state ambient air quality standard for NO_2. The U.S. EPA recently adopted a new 1-hour NO_2 standard of 0.10 ppm.

Sulfur Dioxide

Sulfur dioxide is a colorless gas with a strong odor. It can damage materials through acid deposition. It is produced by the combustion of sulfur-containing fuels, such as oil and coal. Refineries, chemical plants, and pulp mills are the primary industrial sources of sulfur dioxide emissions. Sulfur dioxide concentrations in Humboldt County are well below the ambient standards. Adverse health effects associated with exposure to high levels of sulfur dioxide include irritation of lung tissue, as well as increased risk of acute and chronic respiratory illness (BAAQMD 2011a).

Lead

Lead occurs in the atmosphere as particulate matter. It was primarily emitted by gasoline-powered motor vehicles, although the use of lead in fuel has been virtually eliminated. As a result, levels throughout the state have dropped dramatically.

Attainment Status

Areas that do not violate ambient air quality standards are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant, using the most recent three years of monitoring data. The North Coast Air Basin as a whole does not meet state standards for PM_{10}. The air basin is considered attainment or unclassified for all other air pollutants. Unclassified typically means the region does not have concentrations of that pollutant that exceed ambient air quality standards.

Ambient Air Quality – Monitoring Station Data and Attainment Designations

Table 3.3-2 summarizes air quality data for the Eureka-Humboldt Hill monitoring station in Humboldt County, which is the closest monitoring station to the Project site. Data from 2013 are the most recent available. The data reported in Table 3.3-2 show that ambient air quality standards were not exceeded over the 2011-2013 period. Carbon monoxide, nitrogen dioxide, sulphur dioxide, and lead are not measured in the county at the Eureka-Humboldt Hill monitoring station. These pollutants have been measured at very low levels in the past.

Table 3.3-2 Highest Measured Air Pollutant Concentrations in Humboldt County

Pollutant	Average Time	Measured Concentration		
		2012	2013	2014
Ozone Eureka-Humboldt Hill	8-Hour	0.049 ppm	0.049 ppm	0.043 ppm
	1-Hour	0.053 ppm	0.055 ppm	0.049 ppm
Respirable Particulate Matter (PM_{10}) Eureka-Humboldt Hill	24-Hour	28.8 µg/m^3	45.8 µg/m^3	104.7 µg/m^3
	Annual	9.6 µg/m^3	11.9 µg/m^3	* µg/m^3
Fine Particulate Matter ($PM_{2.5}$) Eureka-Humboldt Hill	24-Hour	21.2 µg/m^3	21.1 µg/m^3	9.5 µg/m^3
	Annual	6.7 µg/m^3	* µg/m^3	3.0 µg/m3

Source: CARB 2016

Notes: * There was insufficient (or no) data available to determine the value.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are a broad class of compounds known to cause morbidity or mortality (usually because they cause cancer or serious illness) and include, but are not limited to, the criteria air pollutants listed above in Table 3.3-1. TACs are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). TACs are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway). Because chronic exposure can result in adverse health effects, TACs are regulated at the regional, state, and federal level. The identification, regulation, and monitoring of TACs is relatively new compared to that for criteria air pollutants that have established ambient air quality standards. TACs are regulated or evaluated on the basis of risk to human health rather than comparison to an ambient air quality standard or emission-based threshold.

Diesel exhaust is the predominant TAC in urban air with the potential to cause cancer. It is estimated to represent about two-thirds of the cancer risk from TACs (based on the statewide average). According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. This complexity makes the evaluation of health effects of diesel exhaust a complex scientific issue. Some of the chemicals in diesel exhaust, such as benzene and formaldehyde, have been previously identified as TACs by the CARB, and are listed as carcinogens either under the state's Proposition 65 or under the federal Hazardous Air Pollutants programs. California has adopted a comprehensive diesel risk reduction program, and recently adopted new regulations requiring the retrofit and/or replacement of construction equipment, on-highway diesel trucks, and diesel buses in order to lower $PM_{2.5}$ emissions and reduce statewide cancer risk from diesel exhaust.

3.3.2 Regulatory Framework

Federal

The federal Clean Air Act of 1977 (CAA) governs air quality in the United States. In addition to being subject to federal requirements, air quality in California is also governed by more stringent regulations under the California Clean Air Act. At the federal level, the U.S. EPA administers the CAA. The California Clean Air Act is administered by the CARB and by the Air Quality Management Districts at the regional and local levels.

The U.S. EPA is responsible for enforcing the federal CAA. The U.S. EPA is also responsible for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the CAA and subsequent amendments. The U.S. EPA regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships and certain types of locomotives. The U.S. EPA has jurisdiction over emission sources outside state waters (e.g., beyond the outer continental shelf) and establishes various emission standards, including those for vehicles sold in states other than California. Automobiles sold in California must meet the stricter emission standards established by the CARB.

State

In California, the CARB, which is part of the California Environmental Protection Agency, is responsible for meeting the state requirements of the federal CAA, administering the California Clean Air Act, and establishing the California Ambient Air Quality Standards (CAAQS). The California Clean Air Act, as amended in 1992, requires all air districts in the state to endeavor to achieve and maintain the CAAQS. The CARB regulates mobile air pollution sources, such as motor vehicles. It is responsible for setting emission standards for vehicles sold in California and for other

emission sources, such as consumer products and certain off-road equipment. It oversees the functions of local air pollution control districts and air quality management districts, which in turn administer air quality activities at the regional and county level.

Regional and Local

North Coast Unified Air Quality Management District

The North Coast Unified Air Quality Management District (Air District), one of 35 air districts in California, has jurisdiction over Humboldt, Del Norte, and Trinity counties. The District's primary responsibility is for controlling air pollution from stationary sources and is committed to achieving and maintaining healthful air quality throughout the tri-county jurisdiction. The Air District has permit authority over most types of stationary emission sources and can require stationary sources to obtain permits, impose emission limits, set fuel or material specifications, or establish operational limits to reduce air emissions. The District monitors air quality; enforces local, State and federal air quality regulations for counties within its jurisdiction; inventories and assess the health risks of TACs, and adopts rules that limit pollution.

As noted earlier, the District is listed as "attainment" or "unclassified" for all the federal and state ambient air quality standards except for the state 24-hour particulate (PM_{10}) standard. In 1995, the District provided a study to identify the contributors of PM_{10} which is summarized in the Particulate Matter PM_{10} Attainment Plan draft report. The District's website cautions the reader when referencing the report as it "is not a document that is required in order for the District to come into attainment for the state standard" and that the District is planning to update the document.

For construction emissions, the District has indicated that emissions are not considered regionally significant for projects whose construction would be of relatively short in duration, lasting less than one year. For project construction lasting more than one year or that involves above average construction intensity in volume of equipment or area disturbed, construction emissions may be compared to the stationary source thresholds (NCUAQMD 2015).

For operational activities, Rule 110 - New Source Review (NSR) And Prevention of Significant Deterioration establishes the pre-construction review requirements for new and modified stationary sources of air pollution and to provide mechanisms by which authorities to construct for such sources may be granted without interfering with the attainment or maintenance of ambient air quality standards. Rule 110 also includes the significance thresholds that are used in this analysis.

3.3.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to air quality, as defined by the CEQA Guidelines (Appendix G), if it would:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- 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);
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

The NCUAQMD does not have established CEQA significance criteria to determine the significance of impacts that would result from projects such as the proposed Project; however, the NCUAQMD does have criteria pollutant significance thresholds for new or modified stationary source projects proposed within the NCUAQMD's jurisdiction. NCUAQMD has indicated that it is appropriate for lead agencies to compare proposed construction emissions that last more than one year to its stationary source significance thresholds, which are:

- Nitrogen oxides – 40 tons per year
- Reactive organic gases – 40 tons per year
- PM_{10} – 15 tons per year
- Carbon monoxide – 100 tons per year.

If an individual project's emission of a particular criteria pollutant is within the thresholds outlined above, the project's effects concerning that pollutant are considered to be less-than significant.

Areas of No Project Impact

Would the Project conflict with or obstruct implementation of the applicable air quality plan? As discussed previously, the NCUAQMD has published the Particulate Matter Attainment Plan in 1995, representing the most current applicable air quality plan for the county. This plan was prepared to present available information about the nature and causes of exceedances of the PM_{10} standards, and to identify cost-effective control measures which can be implemented to bring ambient PM_{10} levels down to levels that will meet the California Ambient Air Quality Standards for PM_{10}. This document is designed to serve as a summary of the District's current status, a long range planning tool and a roadmap for future District policy. Consistency with this plan is the basis for determining whether the proposed Project would conflict with or obstruct implementation of an applicable air quality plan. The plan does not include measures or policies that would apply directly to the Project. Implementation of the Project would not result in impacts related to conflicts with an applicable air quality plan.

Would the Project create objectionable odors affecting a substantial number of people? Facilities that typically are considered to potentially create objectionable odors include such uses as wastewater treatment plants, landfills, asphalt plants, coffee roasters, and food processing. Operation of the Project (i.e., limited passive recreational use and ongoing maintenance and monitoring activities) would not create a new source of objectionable odors nor would it create a new receptor. Therefore, the Project would not create noticeably objectionable odors affecting a substantial number of people.

3.3.4 Methodology

Project-related air pollutant emissions are anticipated to be almost exclusively short-term construction-related emissions. Some long-term operations-related emissions would occur as a result of channel and infrastructure maintenance, and sediment removal, but these emissions are not expected to have a significant impact. Therefore, operation emissions are discussed qualitatively. Short-term construction emissions for the project were calculated using the latest version of the California Emissions Estimator Model, CalEEMod (Version 2013.2.2) and compared against the stationary source significance thresholds.

The on-site construction modeling was based on the construction equipment inventories and schedule developed for the Project. Given the nature of the Project, the modeled construction phases are limited to Grading and Excavation. The mobile emissions during construction, which

include excavators, scrapers, rubber tired dozers, compactors, graders, dump trucks, and worker trips, were included in the CalEEMod model. For the purpose of this analysis, the modeling conservatively assumed that construction would occur in a single construction season, thereby resulting in the maximum potential peak emissions. Phasing the construction over multiple seasons is likely and would therefore reduce the calculated peak emissions.

Appendix D includes the CalEEMod model output and emissions computations.

3.3.5 Impacts and Mitigation Measures

Impact AQ-1: Violate Any Air Quality Standard or Result in Cumulatively Considerable Net Increase of Any Criteria Pollutant for which the Project Region is in Non-attainment.

Construction Air Pollutants

By its very nature, air pollution is largely a cumulative impact, in that individual projects are rarely sufficient in size to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions.

For the purpose of this analysis, construction was conservatively assumed to occur over a 6-month period, or about 110 days. However, as noted above, construction could occur over multiple seasons. Table 3.3-3 presents construction period emissions, based on the CalEEMod model results. Construction period emissions would not exceed significance thresholds, and therefore would be less than significant.

Table 3.3-3 Construction Criteria Air Pollutant Emissions (tons per year)

	ROG	NO_x	PM_{10}	Carbon Monoxide
Construction Emissions	1.5	17.4	4.8	10.5
Threshold	40	40	15	100
Exceed Threshold?	No	No	No	No

Notes: Assuming 110 days of construction.

Construction Dust

During earth moving activities, fugitive dust (PM_{10}) would be generated. The amount of dust generated would be highly variable and is dependent on the size of the area disturbed at any given time, amount of activity, soil conditions, and meteorological conditions. Unless controlled, fugitive dust emissions during construction of the proposed Project could be a significant impact, therefore, Mitigation Measure AQ-1 (Dust Control Measures during Construction) will be incorporated to reduce emissions associated with earth moving activities.

Operation

During operation of the Project, some emissions would occur from worker trips and equipment as a result of maintenance activities. These activities would be infrequent and short-term in nature. In addition, they are anticipated to be no greater than the traditional maintenance historically

performed on these lands. Emissions related to operation of the Project are considered less than significant.

Mitigation Measure AQ-1: Dust Control Measures during Construction

The contractor shall implement the following Best Management Practices:

1. All exposed surfaces (e.g., parking areas, staging areas, soil piles, active graded areas, and unpaved access roads) shall be watered two times per day.
2. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
3. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
4. All vehicle speeds on unpaved roads shall be limited to 15 mph, unless the unpaved road surface has been treated for dust suppression with water, rock, wood chip mulch, or other dust prevention measures.

Level of Significance: Less than Significant with Mitigation.

Implementation of Mitigation Measure AQ-1 complies with the best management practices recommended by air districts to reduce construction related dust to a less-than-significant level. Therefore, Impact AQ-1 would be reduced to less than significant with implementation of Mitigation Measure AQ-1.

Impact AQ-2: Expose Sensitive Receptors to Substantial Pollutant Concentrations.

Construction activities associated with the Project could expose sensitive receptors in the project area to fugitive dust, ozone, and NO_2. Generally, only sensitive receptors that are within 1,000 feet of an emission source (including construction activities that would occur for more than 1 year) would be evaluated for risk of exposure to substantial pollutant concentrations. There are four residences within 1,000 feet of the project boundary. One residence is located within the project boundary, while the remaining three residences are located outside the project boundary along the southern border, off Centerville Road. The residence within the project boundary is approximately 600 feet from construction activities, specifically the establishment of the Russ Creek Floodplain overflow swales and secondary sediment management area. Of the three residences along Centerville Road, one is directly adjacent to the project boundary but in excess of 1,000 feet of any construction activities that would occur within the project boundary. The other two are in excess of 500 feet from the project boundary and 600 feet from any construction activities (replacement of a culvert with a new bridge). During the 6-month construction period, construction activities would occur in different locations through-out the site. Many of the equipment intensive portions of construction would occur on the interior of the site or further west, away from residences along the southern border of the project site. In addition, the individual construction components of the Project, as identified in Figure 2-4 of the Project Description, would last for significantly less than the overall 6-month construction period. Localized emissions in any one location would not be significant. Given the distance between construction activities and sensitive receptors and the short duration of construction, the impact to sensitive receptors would be less than significant.

Mitigation Measures: No mitigation necessary.

Level of Significance: Less than significant.

3.3.6 Cumulative Impacts

Impact AQ-C-1: Project plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Air Quality.

Project emissions of criteria air pollutants or their precursors would not make a considerable contribution to cumulative air quality impacts. As noted in the project analysis, air pollution, by nature, is mostly a cumulative impact. The significance thresholds and analysis applicable to construction and operational aspects of a project represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the region's air quality conditions. The proposed Project's construction-period emissions would not exceed the quantitative significance thresholds, and fugitive dust emissions would be adequately controlled through implementation of best management practices. Therefore, Project construction would not make a considerable contribution to cumulative air quality impacts.

A review of cumulative construction projects that are planned and approved in the area (see Section 3.0) did not reveal any nearby projects within a 1,000 feet of the project area that would result in a cumulative construction health risk impact. Therefore, the cumulative analysis is the same as for the Project.

Mitigation Measures: No mitigation necessary.

Level of Significance: Less than Significant.

3.3.7 References

BAAQMD, 2011a, *California Environmental Quality Act Air Quality Guidelines*, May.

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Stokes, J, 1981, *Ecological Characterizations of Central and Northern California Coastal Region,* Eel River Watershed Unit, Bureau of Land Management and United States Fish and Wildlife Service, prepared by Jones and Stokes Associates, Inc.: Chapter 6 (pages 163-196).

3.4 Biological Resources

This section evaluates the potential impacts related to biological resources during construction and operation of the Project. The setting section describes the existing environmental conditions for biological resources. The regulatory framework section describes the applicable regulations at the federal, state and local level. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential impacts to biological resources, and identifies the significance of potential impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels. Information in this section is based in part on the studies and reports summarized in Table 3.4-1 below. Key studies are included in Appendix E.

3.4.1 Setting

Information sources that inform the baseline conditions of biological resources and subsequent analyses are presented in this section. Sources of information include biological reports, memorandums, surveys, site visits, and letters summarized in Table 3.4-1.

Table 3.4-1 Summary of Biological Information

Date	Purpose / Title		Personnel
2000	Report	Humboldt County culvert inventory and fish passage evaluation	Ross Taylor
2005	Report	Salt River Watershed Assessment, documentation of fish species	CDFW
2009	Report	Steelhead/rainbow trout (*Oncorhynchus mykiss*) resources of the Eel River watershed, California	CEMAR, Gordon S. Becker and Isabelle J. Reining
December 13, 2011	Report	Delineation of Wetlands and Waters of the U.S. for the Eel River Estuary Preserve	Prepared for The Wildlands Conservancy by Brett Lovelace and Mad River Biologists
October 12, 2011	Report	Eel River Estuary Preserve Biological Evaluation and Wetland Delineation for Proposed Bridge Construction and Road Improvement Project	Prepared for The Wildlands Conservancy by Mad River Biologists
February 2011	Report	Final Environmental Impact Report: Salt River Ecosystem Restoration Project	Grassetti Environmental Consulting in association with California State Coastal Conservancy and Kamman Hydrology & Engineering, Inc.
Spring 2011	Site Visits	Identify potential northern red legged frog (NRLF) breeding habitat	Michael VanHattem (CDFW)
2012	Report	Humboldt Bay and Eel River Estuary benthic habitat project	Susan Schlosser and Annie Eicher
September 29, 2012	Report	Eel River Estuary Preserve Biological Evaluation and Wetland Delineation for Russ Creek Bridge Replacement Project	Prepared for The Wildlands Conservancy by Stephanie Morrissette, Biological Resource Consulting

Date	Purpose / Title		Personnel
January 2013; January 2014	Site Visits	Identify potential northern red legged frog (NRLF) breeding habitat	The Wildlands Conservancy staff; Ken Mierzwa (GHD)
November 12, 2013	Memorandum	Wildlands Conservancy Eel River Property Restoration, Notes Re: habitat characterization and mapping	Prepared for GHD by Annie Eicher of H.T. Harvey and Associates
December 2013	Report	Habitat and Vegetation Mapping for Eel River Estuary Preserve (EREP) Ecosystem Enhanncement Project	GHD
July 2014	Report	Delineation of Uplands for Eel River Estuary Preserve (EREP) Ecosystem Enhanncement Project (GHD 2014)	GHD
October 10, 2014	Report	Special-status Species Evaluation and Special-status Plant and Animal Surveys for Eel River Estuary Preserve (EREP), Ferndale California	GHD
February 25, 2015	Report	Report on Avian Species on the Eel River Estuary Preserve for the Eel River Estuary Preserve Restoration Working Group	The Wildlands Conservancy
June 2015	Report	Fisheries Sampling in the Lower Salt River (Ross Taylor and Associates 2015)	RTA + agency and RCD staff and volunteers
September 2015	Report	Delineation of Uplands for Russ Ranch and Timber (GHD 2015)	GHD
September 2015	Report	Habitat and Vegetation Mapping for Russ Ranch and Timber	GHD
August 6, 2015	Memorandum	Special-status Plant Survey for Russ Ranch and Timber, Eel River Estuary Preserve (EREP) Ecosystem Enhancement Project, Ferndale California	GHD
March 30, 2016	Memorandum	Tidewater Goby Habitat Assessment for Eel River Estuary and centerville Slough Enhancement Project	H.T. Harvey and Associates
May 2016	Maps	GIS maps of Western Snowy Plover nesting and non-breeding occurrences	USFWS, John Hunter

The Project site is within the Eel River Delta and Estuary and located just southwest of the Salt River. The Eel River Estuary includes approximately 24 square miles of delta lands, wetlands, and estuarine channels that receive runoff from 3,700 square miles of the Eel River Basin. It is one of the most significant estuaries along the California coast, with a mosaic of tidal flats, sloughs, marshes, and seasonal wetlands that support resident and migratory birds (Schlosser and Eicher 2012; Grassetti et al. 2011). Many remnant slough channels and streams were historically connected yet have been disconnected through historic reclamation activities and continuous agricultural land use. These include the Project Area tributaries Russ Creek, Shaw Creek and Creamery Ditch. These tributaries resemble Francis Creek, which also drains the Wildcat Hills a

short distance to the east and the watershed within the Project Area displays the same geology, slope and hydrologic characteristics as Francis Creek, with the exception of their discontinuity with the estuary, a feature that suggests high biological potential for restoration of habitat value. Within this landscape setting, the Project site extends from the Eel River and Salt River south to the toe of the Wildcat Hills, which rise sharply above the floodplain. The site consists of gently sloping alluvial floodplain that drains west and north to the Eel River. Vegetation types are further described below and consist of sand dune belt along the west coastline, agricultural pastures (both upland and wetland), and mixtures of freshwater and brackish wetlands.

Existing Habitat Conditions

This section summarizes habitat and vegetation mapping efforts at EREP and Russ Ranch & Timber, L.L.C (Table 3.4-2, Figure 3.4-1). In order of total acreage mapped, habitats include: agricultural pasture and agricultural wetlands (966 acres); tidal salt marsh and brackish marsh (284 acres); European beachgrass (*Ammophila arenaria)* stabilized dunes (120 acres); open beach (115 acres); freshwater emergent vegetation (92 acres); freshwater aquatic comprised of sloughs/open water channels and freshwater duck ponds (57 acres); dune mat (45 acres); forested riparian areas and scrub shrubs (32 acres); levee/berm (24 acres); and, a combination of bare ground, road, or developed areas (15 acres).

Agricultural grasslands to the south of the Inner Marsh have historically been diked for agricultural use and remain actively managed for grazing. As such, this habitat type is the most abundant vegetation type at EREP and Russ Ranch & Timber, L.L.C. Most of the fields flood seasonally and in general have poorly drained soils. Upland pasture occurs in the southeast portion of the site near Headquarters Barn and in various small dikes, sloughs, or road ways throughout. However, the majority of the area can be referred to as agricultural seasonal wetlands or wet pasture. In many locations, this habitat supports marsh plant species intermixed with pasture grasses. Areas with residually high soil salinity and/or muted tidal seepage are brackish.

Within the portion of the site referred to as the Inner Marsh, the native salt marsh species perennial pickleweed (*Salicornia pacifica*) and saltgrass (*Distichlis spicata*) occur along the margins of slough channels and in wet depressions. The slightly higher flats are dominated by a mixture of saltgrass (which is tolerant of muted tidal conditions) and creeping bentgrass (*Agrostis stolonifera*). Creeping bentgrass, a perennial nonnative grass, is an aggressive competitor with wide environmental tolerances, a long growing season, and the ability to spread vegetatively. Once established, creeping bentgrass forms a thick thatch layer that buffers it from high salinities in underlying soils; however, it does not appear to tolerate full tidal inundation. Once a tidal connection is re-established to the Inner Marsh, it is anticipated that creeping bentgrass will die back and that a mix of salt and brackish marsh species will naturally colonize channel banks and the higher flats. These species could include pickleweed, saltgrass, arrowgrass (*Triglochin maritima*), fat hen (*Atriplex prostrata*), brass buttons (*Cotula coronopifolia*), jaumea (*Jaumea carnosa*), gumplant (*Grindelia stricta*), sea lavender (*Limonium californicum*), tufted hairgrass (*Deschampsia cespitosa*), sand spurry (*Spergularia marina*), Lyngbye's sedge (*Carex lyngbyei*), and cordgrass (*Spartina densiflora*). Cordgrass, an invasive grass that is the target of a region wide eradication effort, achieves near mono-specific dominance in many areas of the Outer Salt Marsh (Figure 3.4-2).

The EREP site includes a dune system on the sand spit south of the mouth of the Eel River that extends south past EREP and along Russ Ranch & Timber, L.L.C. (RR&T) lands and beyond the Project boundary to Centerville Beach. In the north, nearshore dunes are low and broad, whereas in the south nearshore dunes generally are higher and narrower with interspersed dune breaches. The foredune ridge is dominated by the invasive European beachgrass, a California Invasive Plant

Council Cal-IPC clumping perennial grass of high priority, meaning it has severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. On the backside of these foredunes are herbaceous swale communities dominated by rushes. Although classified as a dune mat ecosystem due to substrate, topography, and likely historic conditions, site visits by GHD revealed that few of the typical dune mat-associated species were documented within the Project boundary.

The site contains several small permanent aquatic habitats (sloughs) and freshwater systems, many of which appear to be remnant channels and other intact remnants of the historic Occidental Marsh. These include existing though hydrologically disconnected tributaries to the estuary such as Russ Creek, Shaw Creek and Creamery Ditch, and anthropogenic features such as duck ponds and drainage ditches which range from being either unvegetated, in the case of the sloughs, to being comprised of palustrine emergent vegetation, in the case of the duck ponds. At present, the freshwater and brackish aquatic habitats south of the tidegates, including the Inner Marsh, are largely separate from the fully tidal system to the north. The presence of smaller fishes and other aquatic species in the brackish areas suggests some very limited connectivity between the estuary outside of the tidegate and the aquatic habitat immediately adjacent interior of the tidegate, but certainly not connectivity between this matrix and the estuarine tributaries listed above; the levees and tidegates are believed to be a complete barrier to most aquatic species.

Vegetation Overview

Sensitive biological communities include habitats that are limited in extent, are particularly sensitive to disturbance, and/or fulfil special functions or have special values, such as wetlands, streams, dunes or riparian habitat. These habitats may be protected under federal regulations such as the Clean Water Act; state regulations such as the Porter-Cologne Act, the Coastal Act, and the California Department of Fish and Wildlife (CDFW) Streambed Alteration Program; or local ordinances or policies such as county tree ordinances. CDFW ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database (CNDDB). Sensitive plant communities (herbaceous alliances) are also provided in list format by CDFW (2010). CNDDB vegetation alliances are ranked 1 through 5 based on NatureServe's (2015) methodology, with those alliances ranked globally (G) or statewide (S) with status of 1 through 3 considered to be critically imperilled, imperilled, or vulnerable, respectively (NaturServe 2015). Additionally, CDFW high priority natural community elements are reserved for those areas exhibiting high quality occurrences based on a criterion such as:

i) Lack of invasive species;

ii) No evidence of human caused disturbance such as roads or excessive livestock grazing, or high grade logging; or,

iii) Evidence of reproduction present (sprouts, seedlings, adult individuals of reproductive age), and no significant insect or disease damage, etc.

Non-sensitive biological communities are those communities that are not afforded special protection under CEQA, and other state, federal, and local laws, regulations, and ordinances. These non-sensitive communities may, however, provide suitable habitat for some special-status plant or wildlife species and are part of the general existing site conditions. All potentially sensitive and non-sensitive plant communities were mapped on the site as part of various supporting biological resource evaluations (detailed in Table 3.4-2). This effort permitted the establishment of existing conditions at the Project site including: identification of suitable habitats for special-status species, mapping of sensitive and non-sensitive habitats, and assignment of vegetative alliances.

The biological studies conducted to date cover both the EREP property (approximately 1,100-acres) and the RR&T areas (approximately 460 acres). Portions of RR&T which were developed or intensively grazed were excluded from the study area for special-status species. Vegetation alliances were generalized by dominant vegetation types and land uses, then categorized under habitat types in both the EREP and RR&T portions of the Project site. Vegetation types mapped at the Project site are quantified in Table 3.4-2 and Figure 3.4-1.

Among the individual plant communities identified within the site four are considered Environmentally Sensitive Habitat Associations (ESHA) with statewide (S3) rankings considered to be vulnerable to extirpation within the state of California, thus requiring consideration of any impacts to these rare plant communities or vegetation types (CNPS 2016). These S3 ranked ESHA plant communities include small isolated pockets (0.12 acres) of intact Dune Mat (*Abronia latifolia – Ambrosia chamissonis* Herbaceous Alliance), 4.2 acres of Saltmarsh bulrush marshes (*Bolboschoenus maritimus* Herbaceous Alliance), 12.2 cumulative acres of Coastal dune willow thickets (*Salix hookeriana* Shrubland Alliance), and 37.5 acres of Pickleweed mats (*Sarcocornia pacificia* Herbaceous Alliance). In addition, the numerous estuarine and palustrine emergent wetlands scattered throughout the site See Table 3.4-2 for various types of tidal and non-tidal wetlands and quantification of areas on site which may be considered ESHA per the California Coastal Commission. Additional limited and scattered riparian vegetation scattered across the site would also be considered for protection on a case by case basis by various agencies although it might not qualify for specific sensitive listing at the alliance level. Combined a total of 67.3 acres (3.4%) of the Project area (based on 1 and 2-parameter wetland delineations; GHD 2014; 2015; Mad River Biologists, 2011) were mapped as uplands at the site. The remainder of the area was comprised of various un-delineated transitional wetlands, marshes, and other wetland and upland transitional matrices (discussed below). Also of importance to the site are the Western portions of the Inner Marsh observed to support state or federally listed sensitive plant species (discussed below; Figure 3.4-3).

Table 3.4-2 Existing Habitat Types, Vegetation Names, and Vegetation Alliances at Eel River Estuary Preserve and Russ Properties

Habitat Type	Vegetation Name	Vegetation Alliance	EREP (acres)	Russ (acres)	Subotal (acres)
Tidal salt marsh and brackish marsh	Salt marsh	*Sarcocornia pacifica* Herbaceous Alliance (pickleweed mats)	36.92	0.59	37.51
		Spartina densiflora Semi-Natural Herbaceous Stands (denseflower cordgrass marshes)	16.77		16.77
	Tidal brackish marsh	*Deschampsia cespitosa* Herbaceous Alliance (tufted hairgrass meadows)	2.77		2.77
Diked/muted saline marshes and brackish marshes	Saline marsh	*Sarcocornia pacifica* Herbaceous Alliance (pickleweed mats)	Included above		
	Brackish marsh	*Potentilla anserina* ssp. Herbaceous Alliance (Pacific silverweed marshes)	49.10	0.37	49.47

Habitat Type	Vegetation Name	Vegetation Alliance	EREP (acres)	Russ (acres)	Subotal (acres)
		Atriplex prostrata-Cotula coronopifolia Semi-Natural Herbaceous Stands (fields of fat hen and brass buttons)	3.07	0.01	3.08
		Bolboschoenus maritimus Herbaceous Alliance (salt marsh bulrush marshes)	4.07	0.12	4.19
		Distichlis spicata Herbaceous Alliance (salt grass flats)	0.69	0.17	0.86
Freshwater marsh	Freshwater marsh	*Juncus effusus* Herbaceous Alliance (soft rush marshes)	7.42	8.08	15.5
		Juncus lescurii Herbaceous Alliance (soft rush swales)	7.57		7.57
		Schoenoplectus pungens Seasonally flooded herbaceous community	32.22	0.01	32.23
Pasture and/or agricultural wetland	Freshwater wetland pasture	*Festuca perennis* Semi-Natural Herbaceous Stands (perennial rye grass fields)	141.67	1.20	142.87
	Wet brackish pasture	*Agrostis stolonifera* Semi-Natural Herbaceous Stands (creeping bent grass fields)	12.26	9.75	22.01
		Eleocharis macrostachya Herbaceous Alliance (pale spike rush marshes)	26.46	1.49	29.55
Nearshore dune ridges	Foredune grassland	*Ammophila arenaria* Semi-Natural Herbaceous Stands (European beach grass swards)	117.03	3.09	120.12
Nearshore dune swales	Herbaceous swales	*Abronia latifolia / Ambrosia chamissonis* Herbacious Alliance, *Juncus breweri* association (Brewer's rush swales)	0.37	44.26	44.63
Riparian scrub and freshwater swamp	Willow swamp	*Salix hookeriana* Shrubland Alliance (coastal dune willow thickets); *Alnus rubra* Forest Alliance (red alder forests)	11.26	0.93	12.19
	Riparian scrub	*Baccharis pilularis* Shrubland Alliance (coyote brush scrub)	20.02		20.02
Ruderal	Levee / berm / other upland	*Holcus lanatus / Anthoxanthum odoratum /* miscellaneous	20.06	5.08	25.14

Vegetation Communities

Tidal salt marsh and brackish marshes

In the northern portion of the EREP site known as the Outer Marsh, the area is tidally inundated, with some of the historical tide channel configurations intact. The area receives tidal input via side channels of the Salt River and minor inputs directly from the Eel River via a small channel. As a result, the area supports a complex of tidal salt and brackish marshes (Figure 3.4-1). The area was described and mapped based on limited reconnaissance of readily accessible areas on the west side, aerial photo-interpretation, and available regional mapping of the invasive cordgrass (Grazul and Rowland 2011). Dense stands of cordgrass, easily discernible in aerial imagery, were mapped as the cordgrass Herbaceous Alliance. These areas are juxtaposed within areas of tidal salt marsh mapped as either pickleweed Herbaceous Alliance (in the south of the Project area) or a "Pickleweed complex" (in the north of the Project area) in which pickleweed intermingles with cordgrass or other species. Similarly, tufted hairgrass dominates some areas, but more often occurs as a co-dominant with pickleweed, gumplant, and saltgrass. For mapping purposes, all but the largest occurrences were included in the pickleweed complex (Figure 3.4-1). Further investigation would be needed to fully discern and map the vegetation types in this northern complex and to more accurately quantify the degree of infestation by cordgrass.

Lyngbyei's sedge was locally abundant as a dominant species, generally bordering slough channels or in association with pickleweed away from channels. Where dense, there were few other species, or it was intermixed with the invasive cordgrass. In other locations, Lyngbyei's sedge grew in association with jaumea*,* saltgrass*,* sea plantain *(Plantago maritima),* pickleweed*,* arrowgrass, and tufted hairgrass.

Diked/muted saline marshes and brackish marshes

Diked/muted saline marshes and brackish marshes occur at EREP behind leaking tidegates, bordering channels, and in wet depressions having residual soil salinity. The term "saline marsh" is used to distinguish diked marshes having high salinity from tidal salt marshes (Pickart 2006). These marshes are part of the pickleweed Herbaceous Alliance, but floristically distinct from pickleweed dominated tidal salt marshes, which have a higher diversity of associated species. In diked marshes, a frequently associated species is saltgrass, but overall species diversity is low. Additional details on the occurrence and plant community composition of each habitat type were previously described (GHD Dec. 2013).

Saltmarsh bulrush (*Bolboschoenus maritimus*), a perennial herb commonly found in tidal brackish to saline coastal marshes, is present on slough channel margins and in areas of standing water. Areas where salt marsh bulrush was mapped include wet areas adjacent to pickleweed mats in the Outer Marsh associated with brackish depressions. Additionally, this alliance was mapped sporadically along the Western Drainage, as well as along the margins of Cutoff Slough. Sub-dominants of this alliance include Pacific silverweed (*Argentina egedii),* common threesquare *(Schoenoplectus pungens),* Bolander's rush (*Juncus bolanderi),* and California grey rush (*Juncus patens).*

Freshwater marsh

Soft rush (*Juncus effusus*), a caespitose perennial rush was mapped in an area south of the north barn. Small patches of soft rush alliance were observed by H.T. Harvey & Associates (2013) between the Western Drainage and areas comprised of the Brewer's rush (*Juncus breweri)* alliance. Co-dominants consist of clustered dock (*Rumex conglomeratus)*, arrowgrass, and water parsley (*Oenanthe sarmentosa),* with non-natives such as common velvetgrass (*Holcus lanatus)*

and creeping buttercup (*Ranunculus repens)*. Dane rush (*Juncus lescurii)*, a creeping perennial herbaceous rush, occurred as a dominant species along the western edge of the Outer Marsh and near the Russ Creek washout areas. Co-dominant species included Pacific silverweed*,* creeping bentgrass*,* common threesquare*,* California grey rush, and perennial rye grass (*Festuca perennis)* (Figure 3.4-1). The soft rush Herbaceous Alliance has been found to occur in freshwater conditions (Pickart 2006) and as well has been observed locally in upland topographic positions and scattered along dunes.

Pasture and/or agricultural wetland

Perennial rye grass, a non-native grass with a moderate Cal-IPC invasive rank, was mapped extensively in both wet pastures and upland areas. Ranchers have historically seeded pastures with perennial rye grass for cattle feed. Associated species observed at the site include several weedy species in the upland areas [bull thistle (*Cirsium vulgare),* creeping thistle (*Cirsium arvense),* common velvetgrass*,* curly dock (*Rumex crispus)*, and English plantain (*Plantago lanceolate)*]. In the perennial brackish areas, fat hen*,* brass buttons*,* and pale spike rush (*Eleocharis macrostachya)* were commonly observed. Smaller discrete patches of other vegetation alliances/types occur as inclusions within the area mapped as perennial rye grass Semi-Natural Herbaceous Stands. However, due to the highly variable components and gradations/mixture of plant species, this area was not mapped with further detail.

Extensive stands of creeping bentgrass are prominent in the grazed areas. When creeping bentgrass occurred in brackish locations*,* saltgrass was a frequently associated species, whereas in freshwater uplands and wetlands it was associated with perennial rye grass or Pacific silverweed*,* a salt-tolerant perennial herb commonly found in both freshwater and brackish wetlands. Associated species found within this habitat type include non-native grasses such as, creeping bentgrass*,* common velvetgrass*,* perennial rye grass, and the non-native forbs bird's-foor trefoil (*Lotus corniculatus)* and curly dock. Predominance of creeping bentgrass has altered this native plant community sufficiently to be considered a creeping bentgrass Semi-Natural Herbaceous Stand. Creeping bentgrass, a perennial herb non-native to California, has invaded native vegetation types throughout the state, especially mesic ones (Sawyer et al. 2009). It has a Cal-IPC Inventory rank of Limited, meaning the ecological impact of this species is considered minor on a state-wide level (Cal-IPC 2016). However, creeping bentgrass has been suggested to receive a local rating of High within the Project region based on its widespread invasion of diked wetlands and ability to alter native plant communities (Pickart 2006). For instance, this aggressive competitor has a wide environmental tolerance, a long growing season, and the ability to spread vegetatively. These traits are evident at the Project site where this aggressive non-native community type is seen displacing native halophyte communities known as salt grass flats and pickleweed mats.

Pale spike rush is a mat or hummock forming perennial rush of freshwater and brackish wetlands. Much of the area mapped with this alliance type was observed in or near standing water in close proximity to the duck ponds south of the Inner Marsh. Pacific silverweed and creeping bentgrass comprise the sub-dominant component of this community type. Other associated species include saltgrass*,* soft rush*,* curly dock*,* creeping thistle and perennial rye grass.

Nearshore Dune Ridges

The foredune ridge is dominated by the invasive European beachgrass, a clumping perennial grass with Cal-IPC rating of high priority, growing with sparse presence of coastal sand-verbena (*Abronia latifolia)*, shore bindweed (*Calystegia soldanella),* dune tansy (*Tanacetum bipinnatum),* and seaside daisy (*Erigeron glaucus)*. An area northwest of the Outer Marsh contains a stand of

European beachgrass with scattered coastal shrubs, including the native shrub coyote brush *(Baccharis pilularis* ssp. *consanguinea*) and a shrubby lupine which appears to be a hybrid between the native riverbank lupine (*Lupinus rivularis)* and the invasive yellow bush lupine (*Lupinus arboreus)*.

Nearshore Dune Swales

On the backside of the foredune are herbaceous dune swales dominated by Brewer's rush. These "dry swales" have been described from the South and North spit of Humboldt Bay (Pickart 2005, 2006). Subsequently, the Brewer's rush association was described within the coastal sand-verbena – beach bur Alliance (*Ambrosia chamissonis*) (aka dune mat) in a recent floristic classification of Humboldt County dunes (Pickart and Solomescsh, unpublished data; HTH 2013). At the site, very few associated species typically characteristic of dune mat were present in Brewer's rush dry swales. These included occasional observations of coastal sand-verbena, beach bur, shore bindweed, and sand mat (*Cardionema ramosissimum)*. In contrast, lower, wetter swales were vegetated primarily by common threesquare, with Pacific silverweed and creeping bentgrass associates. This species composition notably differs from wet dune swales described from the North Spit of Humboldt Bay, which are characterized as being comprised mainly of slough sedge (*Carex obnupta)* (Pickart 2006).

Riparian Scrub and Freshwater Wetland

Willow (*Salix* spp.) swamps and riparian scrub occur on channel banks of the nearby Salt River, where the elevation is higher and there is a greater freshwater influence than in adjacent marshlands. A small stand of Coastal dune willow and red alder (*Alnus rubra*) found in floodplains, creeks, and rivers occur along portions of Russ Creek. Associated species in this habitat consist of palustrine herbaceous species such as Pacific silverweed and soft rush. Willows also occur on the Project site along channel or slough banks flowing into the Salt River, where the elevation is higher and there is a greater freshwater influence. The willows are evident in the aerial imagery but were not visited in the field due to access constraints. Coastal dune willow is the only willow that has been reported occurring on the EREP (TWC unpublished data). Willows have also been planted along freshwater ditch margins in the southeast part of EREP, but the total area is small and scattered, thus not mapped individually. Red alder was observed intergrading with Coastal dune willow.

Coyote brush a common native shrub of coastal and inland areas of California, was observed intergrading with various non-natives near willow areas bordering the Salt River, at the higher elevation margin of tidal marshes, along slough channels, and sporadically on levees.

Ruderal Uplands

The Project area is interspersed with old levee and berm systems constructed to control seasonal flooding. The vegetation associated with these levees is mostly ruderal and comprised of various non-native and invasive species including bull thistle*,* creeping thistle*,* perennial rye grass*,* creeping buttercup*,* common velvetgrass*,* creeping bentgrass*,* white clover *(Trifolium repens)*, and strawberry clover (*Trifolium fragiferium)*. Additionally, a few native species occurred on the levees, including California aster (*Symphyotrichum chilense),* yarrow *(Achillea millefolium),* gumplant and coyote brush.

Federal and State Jurisdictional Wetlands and Waters

The delineation efforts conducted at the EREP and RR&T portions of the site to date have been conducted with a focus on delineating upland areas. The purpose of this approach was to focus efforts on areas that were topographically higher and therefore might exhibit characteristics of

upland soils, vegetation, and hydrological indicators. The majority of the area consists of a complex of palustrine emergent wetlands, estuarine wetlands (brackish or tidal), grazed wetlands, as well as transitional areas that support a mix of wetland and upland conditions. Both two and three parameter uplands were mapped to meet definitions of the USACE and Coastal Commission. The descriptions in the following paragraph include references to wetland indicator status for each plant species mentioned as follows: Obligate (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and not listed (NL).

Palustrine and Estuarine Wetlands

Wetlands observed at the site are predominantly palustrine emergent seasonal wetlands (National Wetlands Inventory code PEM1Cd; Federal Geographic Data Committee 2013; Cowardin et al. 1979) with some brackish estuarine wetlands and open slough channels, as well as two-parameter USACE upland areas that are potentially considered jurisdictional (degraded/seasonal) according to Coastal Commission definitions. These wetlands are shown on Figure 3.4-4. Dominant species within wetlands consist of creeping bentgrass (FAC), perennial rye grass (FAC), birds-foot trefoil, clover species (FAC), common velvetgrass (FAC), and Pacific silverweed (OBL). In some low-lying portions of the site, including broad pasture areas as well as along roadsides and some levees, current or historic brackish inputs allow for dominant species assemblage to include non-native cordgrass (NL) and fat hen (FAC), as well as native brackish species such as pickleweed (OBL), salt grass (FACW), and occasionally tufted hairgrass (FACW).

Uplands

The uplands mapped at the site consist of levees, roads, developed areas, stockpiled uplands, as well as natural topographically higher areas and dunes. The identified upland areas are within various transitional matrices of predominantly palustrine agricultural wetlands, brackish marsh, and slough channels. Additional upland areas exist on the site that were not delineated, including the large upland dune complex to the west and likely some additional upland micro-topographic areas within the predominant wetland and transitional matrix. The upland areas are predominantly perennial grassland series within the open agricultural bottoms. The upland areas consist predominantly of ruderal nonnative vegetation (creeping bentgrass-tall fescue (*Festuca arundinacea)* Semi-Natural Herbaceous Stands). Upland areas of EREP include dominant FAC species observed in the wetlands and transitional areas as described above, such as common velvetgrass (FAC)*,* bentgrass (FAC), and bird's-foot trefoil (FAC). Additional dominant upland species include sweet vernal grass (*Anthoxanthum odoratum*, FACU), yarrow (FACU), English plantain (FACU), bull thistle (FACU), capeweed (*Arctotheca calendula*, NL), and prickly sow thistle (*Sonchus asper* ssp. *asper*, FACU). In addition, at the RR&T portion of the Project site, few FACW or OBL plant species were present in the wetland plots, apart from Pacific silverweed (OBL), and most of the hydrophytic vegetation consisted of FAC or FACU species including: creeping buttercup (FAC), perennial rye grass (FAC), white clover (FAC), common velvetgrass (FAC), dock (*Rumex transitorius*, FAC), soft chess (*Bromus hordeaceus*, FACU), and orchard grass (*Dactylis glomerata*, FACU). However, many of these plant species are also present in upland plots in conjunction with other species in most cases. In conclusion, the absence of wetland soil and wetland hydrology in upland areas corroborates the assumption that plants within most upland portions of the property that are listed as FAC are not actually growing as hydrophytes.

At the EREP portion of the Project site, 11.6 acres of three parameter uplands were mapped that meet USACE and Coastal Commission upland definitions and are non-jurisdictional. Additionally, 11.4 acres of two-parameter uplands were mapped by GHD including over nine acres of upland previously mapped by MRB that meet the USACE definition of upland, but may be considered

jurisdictional by the Coastal Commission due to presence of one wetland parameter. Additionally, to date an additional 39.3 acres of uplands have been mapped by others on the EREP portion of the Project site (MRB 2011; Morrisette 2012). An additional 5.0 acres of uplands were documented within the RR&T portion of the site. In summary, one and two parameter mapped palustrine emergent wetlands comprised a total of 67.3 acres (3.4%) of the site with the remainder being comprised of over 1,000 acres areas of wetland/transitional complexes, ruderal transitional areas, brackish marsh, and slough channels occasionally interspersed with small micro-topographical features that are likely uplands or dunes (GHD, 2014, 2015; MRB 2011).

Waters of the U.S. and State: Other waters, besides wetlands, subject to USACE jurisdiction under Section 404 of the Clean Water Act include lakes, rivers, and streams (including intermittent streams) for non-tidal areas. Non-tidal waters of the U.S. are defined at the ordinary high water mark (OHWM) following the USACE Regulatory Guidance Letter No. 05-05, Ordinary High Water Mark Identification (USACE 2005). Tidal waters are delineated at the High Tide Line (HTL) which can be based on elevation yet will vary locally based on observance of drift deposits, changes in vegetation, topography, or scour. Other Waters of the U.S. at the site include unvegetated slough channels, Russ Creek, and Cutoff Slough.

Riparian and Other Wet Areas: The Project site was evaluated to locate potential intermittent streams not already designated wetlands or waters of the U.S./State as well as associated riparian habitat following the standard guidance provided in A Field Guide to Lake and Streambed Alteration Agreements, Sections 1600-1607, California Fish and Game Code (CDFG 1994). The guidance for CDFG Section 1602 jurisdiction is typically understood to include streams and to extend laterally to the top-of-bank. If riparian vegetation is present within the top-of-bank, then CDFG jurisdiction extends to the outer dripline of such vegetation. Riparian vegetation is sparse and scattered at the site, with willows or alders existing along levees and creek channels, particularly on the Russ portion of the site. The riparian areas were mostly determined to be upland based on absence of wetland soil and hydrology and location on topographic high points along creeks, and thus riparian habitat is subsumed under the dune willow – red alder vegetation alliance section above.

Special-Status Plant Species

Table 3.4-3 summarizes the potential for occurrence of special-status plant species that are known to occur in the Project vicinity. Seventeen plant species were initially determined at a cursory level to have a moderate or high potential to occur at the site. Seasonally-appropriate plant surveys determined that five special-status terrestrial and one aquatic plant species were present and their extent was mapped (Figure 3.4-3). Descriptions of these special-status plant species identified as present at the site are included below. Beyond the 17 species with moderate to high potential to occur, the remaining plant species that could occur in the vicinity were determined to have low-potential to occur at the site due to one or more of the following reasons:

1. Edaphic (soil) conditions (e.g., serpentine) necessary to support some special-status plant(s) are not present at the site;
2. Associated vegetation communities (e.g., coastal scrub, coniferous forest, woodland, bluff) necessary to support some special-status plant(s) are not present at the site;
3. The presence of extensive highly competitive, non-native plant species (e.g., Cordgrass); and
4. The site is outside of the known elevation and/or localized distribution of some special-status plant(s) (e.g., montane).

Table 3.4-3 Potential for Special-Status Plant Species to Occur within the Project

Species	Status1	Habitat Requirements	Potential to Occur On-site	Results
PLANTS				
pink sand verbena *Abronia umbellata var. breviflora*	1B.1	Coastal dune, coastal strand; located on foredunes and interdunes with low vegetation cover. Elevation range: 0 – 35 ft. Blooms: June – October.	**High Potential.** The site contains substrate that could support this species.	**Not Observed**. This species was not observed during plant surveys
coastal marsh milk-vetch *Astragalus pycnostachyus var. pycnostachyus*	1B.1	Coastal dune (mesic), coastal scrub, marshes, and swamps (coastal salt and streamside). Elevation range: 0 – 100 ft. Blooms: April – October.	**High Potential**. The site contains substrate that could support this species.	**Not Observed**. This species was not observed during plant surveys
bristle-stalked sedge *Carex leptalea*	2B.2	Bogs and fens, meadows and seeps (mesic), freshwater marshes and swamps. Elevation range: 0 – 2,300 ft. Blooms: March – July.	**Moderate Potential.** The site contains freshwater marsh only along edges of streams and sloughs.	**Not Observed**. This species was not observed during plant surveys
Lyngbye's sedge *Carex lyngbyei*	**2B.2**	Marshes and swamps; brackish to freshwater. Elevation range: 0 – 33 ft. Blooms: April – August.	**High Potential.** The site contains suitable substrate to support this species.	**Present**. >5,000 individuals were observed during plant surveys in 2014
Humboldt Bay owl's-clover *Castilleja ambigua* ssp. *humboldtiensis*	**1B.2**	Coastal salt marsh; located in marshes associated with salt grass, cordgrass, pickleweed, and jaumea. Elevation range: 0 – 10 ft. Blooms: April – August.	**High Potential**. The site contains suitable substrate to support this species.	**Present.** >10,000 individuals were observed during rare plant surveys in 2014
Oregon coast paintbrush *Castilleja affinis ssp. litoralis*	2B.2	Coastal bluff scrub, coastal dune, coastal scrub; located on sandy substrate. Elevation range: 50 – 330 ft. Blooms: June.	**High Potential.** The site contains suitable substrate that could support this species.	**Not Observed.** This species was not observed during plant surveys
point reyes bird's-beak *Chloropyron maritimum ssp. palustre*	1B.2	Coastal salt marshes and swamps. Elevation range: 0 – 33 ft. Blooms: June – October.	**High Potential.** The site contains suitable substrate that could support this species.	**Not Observed.** This species was not observed during plant surveys

Species	Status1	Habitat Requirements	Potential to Occur On-site	Results
Whitney's farewell-to-spring *Clarkia amoena ssp. whitneyi*	1B.1	Coastal bluff scrub, coastal scrub. Elevation range: 30 – 325 ft. Blooms: June – August.	**Low Potential.** The site contains coastal scrub, yet the nearest observation is 12 km away in more upland habitats.	**Not Present.** This species was not observed during plant surveys
Menzies' wallflower *Erysimum menziesii ssp. menziesii*	FE; SE; 1B.1	Coastal dune; located on stabilized and shifting dunes and coastal strand. Elevation range: 0 – 115 ft. Blooms: March – June.	**High Potential**. The site contains suitable substrate that could support this species.	**Not Observed.** This species was not observed during plant surveys
giant fawn lily *Erythronium oregonum*	2B.2	Cismontane woodland, meadows, and seeps, occasionally on serpentinite, rocky openings. Elevation range: 328 – 3,775 ft. Blooms: March – June (July).	**Low Potential.** The site does not contain woodland habitat that support this species.	**Not Present.** This species was not observed during plant surveys
coast fawn lily *Erythronium revolutum*	2B.2	Bogs and fens, broadleafed upland forest, North Coast coniferous forest, mesic streambanks. Elevation range: 0 – 5,250 ft. Blooms: March – July or August.	**Moderate Potential.** The site contains sparse riparian habitat yet does not have typical habitat that supports this species.	**Not Observed.** This species was not observed during plant surveys
minute pocket moss *Fissidens pauperculus*	1B.2	North Coast coniferous forest on damp soil. Elevation range: 33 – 3,360 ft. Blooms: NA.	**Low Potential**. The site does not contain coniferous forest habitat to support this species.	**Not Present.** This species was not observed during plant surveys
Pacific gilia *Gilia capitata ssp. pacifica*	1B.2	Coastal bluff scrub, Chaparral openings, Coastal prairie, valley and foothill grasslands. Elevation range: 15 – 4,365 ft. Blooms: April – August.	**High Potential.** The site contains suitable substrate that could support this species.	**Not Observed.** This species was not observed during plant surveys
Dark-eyed gilia *Gilia millefoliata*	**1B.2**	Coastal strand, dunes. Elevation range: 0 – 30 ft. Blooms: March – July.	**High Potential.** The site contains suitable substrate to support this species.	**Present**. 50 individuals were observed during plant surveys in 2014.

Species	Status1	Habitat Requirements	Potential to Occur On-site	Results
short-leaved evax *Hesperevax sparsiflora var. brevifolia*	1B.2	Coastal bluff scrub, coastal dune; located on sandy bluffs and flats near the immediate coastline. Elevation range: 0 – 700 ft. Blooms: March – June.	**Moderate Potential**. The site contains small portions of suitable coastal habitat that could support this species.	**Not Observed.** This species was not observed during plant surveys
glandular western flax *Hesperolinon adenophyllum*	1B.2	Chaparral, cismontane woodland, valley and foothill grassland, usually on serpentine soils. Elevation range: 490 – 4,315 ft. Blooms: May – August.	**Low Potential**. The site does not contain upland habitat types to support this species.	**Not Present.** This species was not observed during plant surveys
marsh pea *Lathyrus palustris*	2B.2	Bogs & fens, lower montane coniferous forest, marshes and swamps, north coast coniferous forest, coastal prairie, and coastal scrub. Elevation 1-300 ft. Blooms: March – April.	**Moderate Potential**. The site contains small portions of suitable marsh that could support this species.	**Not Observed**. This species was not observed during plant surveys in 2014.
beach layia ***Layia carnosa***	**FE; SE; 1B.1**	Coastal dunes, coastal scrub on sandy soils. Elevation range: 0 – 200 ft. Blooms: March – July.	**High Potential**. The site contains suitable substrate to support this species.	**Present**. 520 individuals were observed during plant surveys in 2014.
western lily *Lilium occidentale*	FE; SE; 1B.1	Bogs and fens, coastal bluff scrub, coastal prairie, coastal scrub, freshwater marshes and swamps, North Coast coniferous forest openings. Elevation range: 6 – 610 ft. Blooms: June – July.	**Moderate Potential**. The site contains small portions of suitable marsh habitat that could support this species.	**Not Observed.** This species was not observed during plant surveys
Howell's montia *Montia howellii*	2B.2	Meadows and seeps, North Coast coniferous forest, vernal pools or vernally mesic soils, sometimes roadsides. Elevation range: 10 – 2,740 ft. Blooms: February or March – May	**Low Potential**. The site does not contain vernal pool habitat to support this species.	**Not Present.** This species was not observed during plant surveys
Wolf's evening-primrose *Oenothera wolfii*	1B.1	Coastal bluff scrub, coastal dune, coastal prairie, lower montane coniferous forest; located on sandy substrates in mesic sites. Elevation range: 10 – 2,625 ft. Blooms: May – October.	**Moderate Potential**. The site has small portions of suitable coastal habitat that could support this species.	**Not Observed.** This species was not observed during plant surveys

Species	Status1	Habitat Requirements	Potential to Occur On-site	Results
seacoast ragwort *Packera bolanderi var. bolanderi*	2B.2	Coastal strand and scrub, North Coast coniferous forest. Elevation range: 100 – 2115 ft. Blooms: April – May.	**Low Potential**. The site contains only small portions of habitat that could support this species.	**Not Present.** This species was not observed during plant surveys
Oregon polemonium *Polemonium carneum*	2B.2	Coastal prairie, coastal scrub, lower montane coniferous forest. Elevation range: 0 – 6,000 ft. Blooms: April – September.	**Low Potential**. The site contains only small portions of habitat that could support this species.	**Not Present.** This species was not observed during plant surveys
dwarf alkali grass *Puccinellia pumila*	2B.2	Meadows and seeps, marshes and swamps; located in mineral spring meadows and coastal salt marshes. Elevation range: 1 – 35 ft. Blooms: July.	**High Potential**. The site contains suitable substrate that could support this species and it has been observed near the mouth of the Eel River.	**Not Observed.** This species was not observed during plant surveys
Tracy's romanzoffia *Romanzoffia tracyi*	2B.3	Coastal bluff scrub, coastal rocky scrub. Elevation range: 50 – 100 ft. Blooms: March – May.	**Low Potential**. The site does not contain rocky habitat to support this species.	**Not Observed.** This species was not observed during plant surveys
Siskiyou checkerbloom *Sidalcea malviflora ssp. patula*	1B.2	Coastal bluff scrub, coastal prairie, North Coast coniferous forest, often on road cuts. Elevation range: 50 – 2,890 ft. Blooms: May – August.	**Low Potential**. The site contains only small portions of habitat types that could support this species.	**Not Observed.** This species was not observed during plant surveys
coast checkerbloom *Sidalcea oregana ssp. eximia*	1B.2	Lower montane coniferous forest, meadows and seeps, North Coast coniferous forest. Elevation range: 16 – 4,400 ft. Blooms: June – August.	**Low Potential**. The site contains very little riparian habitat types to support this species.	**Not Observed.** This species was not observed during plant surveys
Hitchcock's blue-eyed grass *Sisyrinchium hitchcockii*	1B.1	Cismontane woodland openings, valley and foothill grasslands. Elevation range: 1 – 1,000 ft. Blooms: June.	**Low Potential**. The site does not contain habitat to support this higher elevation species.	**Not Present.** This species was not observed during plant surveys

Species	Status1	Habitat Requirements	Potential to Occur On-site	Results
western sand-spurrey ***Spergularia canadensis var. occidentalis***	**2B.1**	Marshes and coastal saline swamps. Elevation range: 0 – 10 ft. Blooms: June – August.	**High Potential**. The site contains suitable substrate that could support this species.	**Present.** 10 individuals of this species were observed during plant surveys

1) Key to status codes:

FE = Federal Endangered
FT = Federal Threatened
FC = Federal Candidate
FD = Federal De-listed
BCC = USFWS Birds of Conservation Concern
SE = State Endangered
SD = State Delisted
ST = State Threatened
SR = State Rare
SSC = CDFG Species of Special Concern
CFP = CDFG Fully Protected Animal
1A = CRPR List 1A: Plants presumed extinct in California
1B = CRPR List 1B: Plants rare, threatened or endangered in California and elsewhere
2 = CRPR List 2: Plants rare, threatened, or endangered in California, but more common elsewhere
3 = CRPR List 3: Plants about which more information is needed (a review list)
4 = CRPR List 4: Plants of limited distribution (a watch list)

Potential to Occur:

No Potential: Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Low Potential: Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential: Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential: All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Results:

Present: Species was observed on the site or has been recorded (i.e. CNDDB, other reports) on the site recently.

Not Present: Species is assumed to not be present due to a lack of key habitat components.

Not Observed: Species was not observed during surveys.

Table compiled from the California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB), U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory searches of the Tyee, Arcata North, Arcata South, Eureka, Trinidad, Panther Creek, Blue Lake, Korbel, and Cranell USGS 7.5 Minute Quadrangles (CDFW 2016; USFWS 2016).

The five species of special concern that are known to occur at the site are detailed below. In addition, details are also provided for an unobserved but state and federally listed species with high likelihood of occurring in the Project area, and one aquatic species of special concern that was observed at the Project site. Five of these species were observed on the EREP portion of the site during protocol-level surveys in April and June 2014 (GHD October 2014; Table 3.4-4). No sensitive plant species were located during protocol-level surveys of RR&T lands on May 22, June 3, and June 12, 2015 (GHD August 2015). Although many portions of the site are considered low quality for sensitive-listed plant species, due to the dynamic nature of near-coastal habitats, it is acknowledged that population sizes may fluctuate and new species or occurrences are likely to be found during pre-construction surveys.

Table 3.4-4 Special-Status Plant Species Mapped on the EREP

Species	CRPR Status	State / Federal Status	Plant Estimate (#)
Lyngbye's sedge	List 2B.2	None	> 5,000
Humboldt Bay owl's-clover	List 1B.2	None	>10,000
Dark eyed gilia	List 1B.2	None	50
Beach layia	List 1B.1	Federal Endangered, State Endangered	520
Sand spurrey	List 2B.1	None	10

Source: GHD 2014

Lyngbye's Sedge CRPR 2B.2. Present. Lyngbye's sedge has no state or federal listing status and is on CNPS List 2B.2 as it is found only in coastal wetlands along the intertidal/upland interfaces from Del Norte to Marin Counties. This rhizomatous herb requires intact coastal brackish reaches of estuaries, where it can form dense mono-specific stands and is often the first colonizer of open mudflats. This species has been mapped at the EREP portion of the site north of the dike separating the Outer Salt Marsh from the Inner Marsh in a population estimated to contain >5,000 individuals. It is also is known to occur nearby along the lower reaches of the Salt River (GHD 2014). At EREP, the main threat to existing stands is continued encroachment by invasive cordgrass.

Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*) CRPR 1B.2. Present. Humboldt Bay owl's-clover has no state or federal listing status and is on CNPS List 1B.2 as it occurs in very limited areas along the Northern California coast in relatively high-elevation salt marshes and wetland-riparian interfaces. At the EREP portion of the site, more than 10,000 individuals of this hemi-parasitic herb were mapped in five populations along the north portion of the dike separating the Outer Salt Marsh from the Inner Marsh in a narrow band of slightly higher elevation marsh in association with salt grass, cordgrass, pickleweed, and jaumea (GHD 2014). This species is also known from Riverside Ranch in 2010 and the confluence of Cut-Off Slough up to approximately 700 meters above the confluence of Smith Creek (Grasseti et al. 2011).

Menzies' wallflower (*Erysimum menziesii* ssp. *menziesii*). FE; SE; CRPR 1B.1. High Potential. Menzies' wallflower is a state and federally listed endangered species documented from approximately 16 occurrences scattered across foredune systems in Humboldt Bay in Humboldt County, Ten Mile River in Mendocino County, and the Marina Dunes (Monterey Bay) and Monterey Peninsula in Monterey County (UFWS 2013b). Menzies' wallflower is a small, biennial to short-lived perennial succulent plant which flowers and produces fruit only once during its life and is pollinated by a solitary bee species. Seeds are persistent on the plant and appear to only disperse during

winter storm events that manage to dislodge the seeds and scatter them across the dune systems where they occur. The seeds do not persist in the seed bank and seedling survival rates are low. Survival of the species is threatened by several factors including: a white rust disease in the Humboldt Bay area, the encroachment of non-native plant species, deer predation, and recreational impacts. This species occurs in nearshore dunes and swales in low statured vegetation.

Dark-eyed gilia (*Gilia millefoliata*) CRPR 1B.2. Present. Dark-eyed gilia has no state or federal listing status and is on CNPS List 1B.2 as its distribution in California is largely limited to coastal strand and stabilized dune habitats. At the EREP portion of the site, approximately 50 individuals were mapped at a single location near where the dike separating the Outer Salt Marsh from the Inner Marsh meets the dune mat habitat type (GHD 2014). Associated vegetation in the surrounding mapped area includes relatively low densities of European beachgrass in the surrounding dune area, near to, but not intermingled with, Brewer's rush in lower elevation moist areas just to the northeast, and near to beach layia (*Layia carnosa)* to the southeast.

Beach layia FE; SE; CRPR 1B.1. Present. Beach layia is a state and federally listed endangered species documented from approximately 20 occurrences in eight dune systems between Freshwater Lagoon in Humboldt County and Vandenberg Air Force Based in Santa Barbara County (UFWS 2013a). The largest extant occurrences are currently known from dunes in Humboldt County. Beach layia is a succulent, annual herb ranging from a single stem up to a many branched individual up to six inches tall and 16 inches in breadth, in part depending on site moisture. Populations tend to be patchy and subject to large annual fluctuations in size due to shifts in wind erosion patterns, remobilization, factors affecting dune stabilization, and moisture. The wind dispersed seeds often establish in sparsely vegetated areas. It does not survive for long in areas where there is high cover of native or non-native plants. Therefore, encroachment of non-native species, particularly those that stabilize dunes and form dense stands (e.g., European beachgrass) pose threats to the approximately 520 individuals mapped along the coastal dunes at EREP. Approximately 10 distinct populations ranging from 10 to 100 individuals were mapped in the near-shore dunes (GHD 2014). The majority of the mapped populations occur in areas adjacent to where the dike separating the Outer Salt Marsh and Inner Marsh meets the nearshore dunes; smaller populations were also found further south in the vicinity (300 to 800 ft south by south west) of the North Barn. Trampling and off-road vehicle use can harm living plants but moderate disturbance during the off-season is actually beneficial to the plant by opening up areas of bare sand for colonization by wind dispersed seeds.

Sand spurrey (*Spergularia canadensis var. occidentalis*) CRPR 2B.2. Present. Western sand spurrey has no state or federal listing status but is on CNPS List 2B.1as its distribution in California is largely limited to coastal marshes and saline swamps. Western sand spurrey is an annual herb known to occur in both natural and disturbed marsh habitats from California to Alaska. However, its distribution is limited in California with documented observations geographically limited to the Humboldt Bay Area on Calflora. At EREP a single population of 10 individuals was mapped in a nearshore swale habitat location adjacent to the brackish marsh supporting a large population of Lyngbye's Sedge.

Eelgrass (*Zostera marina*). Habitat protected by federal and state regulation; Present. Eelgrass habitat is protected under the Clean Water Act (1977) and the California Coastal Act (1976) and CDFW has a no-net loss policy for eelgrass habitat in state waters and is considered Essential Fish Habitat by NOAA-Fisheries. A California mitigation policy was recently published (NOAA Fisheries 2014). In the Eel River estuary, eelgrass occurs in saline to brackish portions of the estuary, including the Salt River, and has been qualitatively mapped along the Cutoff Slough

south of the of the Cutoff Slough Tidegate. The population density in this area is greatest toward the Tidegate where it reaches approximately 15 percent cover, thinning out gradually to zero percent cover approximately 2,500 feet south of the Tidegate. Eelgrass populations generally die-back during winter, presumably due to freshwater influences and cooler temperatures. New growth appears in April gradually forming localized stands during summer months (NOAA Fisheries 2014).

Wildlife Resources

Avian distribution across the site varies seasonally and is based on vegetation types, water depths, and water salinities. A variety of habitat types such as marshland, pasture, and riparian shrubs attract a significant number of avian species, depending on their morphology and dietary needs. In general, shorebirds are found in the brackish to saline waters in the outer marsh and dunes where an abundance of invertebrates can be found. Waterfowl are generally observed grazing in freshwater ponds, pastures, and sloughs at the EREP portion of the site. Abundant seasonally flooded grassland serves as prime foraging habitat for a number of waterfowl species. Passerines can be found in grassland, wetland, and shrub habitat across the site and the ephemeral wetlands at the site likely provide foraging habitat for many insectivorous passerine species. However, a lack of large trees precludes many species from nesting onsite.

The site has a higher biodiversity of avian species during the winter months when migratory waterfowl and wintering raptors use the preserve for foraging and roosting. Specifically, the EREP attracts thousands of wintering Canada and Aleutian Cackling Geese every winter that graze in large and unmolested numbers on short grass/pastureland on the site. The EREP portion of the site is also a well-known wintering location for Tundra Swans. Incidental migrants and other rarities are also seen during the spring and fall at the site (The Wildlands Conservancy 2015). The federally protected Western Snowy Plover (*Charadrius alexandrinus nivosus*) is known to occur in beach and dune habitats within the site.

Northern red-legged frogs (*Rana aurora*) are confirmed to occur on the EREP portion of the site from 2011 site visits by Michael van Hattem (CDFW) in the southwest part of the site and in 2013, by Ken Mierzwa (GHD) and TWC staff. This species is fairly common in the duck club ponds and in a ditch and associated narrow riparian corridor just west of the Main Barn and EREP office.

Several reports document the importance of the lower Eel River for salmonids and other fishes. Becker and Reining (2009) list many of these reports; a mention of “salmonid fry” in Centerville Slough by CDFG (2005) appears to be the only observation that is potentially within the Project area. More recent fisheries information is available from surveys led by Ross Taylor and Associates (2015, 2016) in the nearby lower Salt River. The closest sample locations are about 1,500 feet straight-line distance east of the tidegate. The 11 sample initial locations included river channel and tributary sloughs and backwaters and ranged from saline to brackish, with a few upstream and less brackish locations added in winter 2015-16. The sample locations are reasonably representative of tidal portions of EREP. A total of 20 species were documented in the samples, including juvenile steelhead, coho, and chinook, Pacific lamprey, longfin smelt, and tidewater goby. Additional information is provided for these species below. The non-native and invasive pikeminnow was also captured during the sampling, generally in areas with lower salinity. Because the samples were recent, conducted in a similar position within the watershed, and included sample events in nine different months, they are believed to have documented a good representation of fish diversity within the estuary. Most of the samples were located in areas recently re-established to tidal marsh on Riverside Ranch as part of the Salt River Ecosystem Restoration Project, so they are also provide information on what species can be expected to colonize similar restored portions of EREP. Because the Salt River and Riverside Ranch sample sites were relatively recently

constructed, habitat structure likely has not yet reached full potential complexity, and long term fishery potential may be greater. Most samples were also conducted by seining, which is an efficient method for sampling smaller fish but may under-represent larger individuals.

Less information is available for non-tidal portions of the Project area. Sampling was conducted at four locations by USFWS in October 2010 (Chamberlain 2010) and at 10 sites by H.T. Harvey in October 2012 (Kramer 2012). Three of the 2010 sample sites were in the Inner Marsh and one was in the western drainage. The 20102 sites were in and just outside of the Inner Marsh. Only two species were captured in the Inner Marsh and non—tidal portions of EREP: Tidewater goby and threespine stickleback. Although based on fewer sample events, it appears that non-tidal portions of the Project area have much lower species richness than adjacent tidal areas and thus considerable potential restoration opportunity.

Ten freshwater sites on Russ Creek were sampled on October 22, 2004. At seven sites within 2,500 feet immediately upstream of Centerville Road, two species were reported: coastal cutthroat trout (one young of the year and 13 age 1+) and 15 threespine stickleback (CDFG 2004). These samples were collected a short distance south (upstream) of the Project area, where the stream gradient is higher than downstream of Centerville Road. Becker and Reining (2009) list earlier studies on Russ Creek, including stocking of steelhead by CDFG in 1934, and absence of steelhead during a 1938 survey. A 1990 CDFG field note mentions that steelhead and salmonids had not been seen “for the past few years.”

Special-status wildlife species are further described and addressed individually in sections below.

Special-Status Wildlife Species

Table 3.4-5 summarizes the special-status wildlife species potentially present in the general vicinity of the Project, and evaluates the potential for each of the species to occur within the Project area. Several special-status wildlife species were observed on the EREP portion of the site during preliminary studies. Twenty-one special-status wildlife species have been determined to have a moderate to high potential to occur in the Project Area. For the remaining species, the site either lacks potentially suitable habitat or may contain potential habitat, but the habitat is disturbed to the extent that the occurrence of special-status species is unlikely. Special-status wildlife species with a moderate to high potential to occur on the parcel are discussed below.

Table 3.4-5 Potential for Special-Status Wildlife Species to Occur within the Project

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
MAMMALS			
Pallid Bat *Antrozous pallidus*	SSC, WBWG high priority	Dry open habitats in grasslands, shrublands, woodlands, and forests; requires rocky habitats for roosting; highly sensitive to disturbance of roosting sites.	**Low Potential.** Prefers more arid climes than the EREP. Additionally, roosting habitat not sufficient on site.
Sonoma Tree Vole *Arborimus pomo*	SSC	North Coast coniferous forest, old growth redwood forest; feeds almost exclusively on Douglas-fir needles but will occasionally feed on grand fir, hemlock, or spruce.	**No Potential.** No suitable habitat is present.
Townsend's Big-eared Bat *Corynorhinus townsendii*	SSC, WBWG high priority	Throughout California on a wide variety of sites, most commonly mesic sites; roosts in the open on walls & ceilings; extremely sensitive to human disturbance. Preference for montane forest in the west.	**Moderate potential.** Suitable roosting habitat not common onsite; old barns could support a few individuals.
Hoary Bat *Lasiurus cinereus*	WBWG medium priority	Prefers open habitat mosaics in coniferous forests with access to medium to large roosting trees; roosts in dense foliage of trees, and occasionally caves, bridges, and mines. Most migrate to South America for the winter, although some stay and hibernate. Mating occurs during the fall and young are born May – July.	**Low Potential.** Suitable roosting habitat not present onsite.
Fisher *Pekania (Martes) pennanti*	FC, SSC	Intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Use cavities, snags, logs and rocky areas for cover and denning. Need large areas of mature, dense forest.	**No Potential.** No suitable breeding or foraging habitat is present.
BIRDS			
Cooper's Hawk *Accipiter cooperii*	none	Open, interrupted, or marginal woodland habitat; nests mainly in riparian deciduous trees in canyon bottoms on river floodplains. Also nests in small woodlots in residential areas.	**Moderate Potential.** Unlikely to nest at the site due to a lack of large trees. Site could serve as foraging habitat however**.**

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Sharp-shinned Hawk	none	Prefers dense forest habitat. Ponderosa pine, black oak, riparian deciduous, mixed conifer, and Jeffrey pine habitats; requires north-facing slopes with plucking perches as critical habitat; nests near (275 feet) of water and riparian habitats.	**Moderate Potential.** Unlikely to nest onsite. Dense forest not present for nesting and roosting. Site could serve as foraging habitat however.
Western Grebe *Aechmophorus occidentalis*	BCC	Breeds on freshwater lakes and marshes, frequently in colonies. Builds nest on floating vegetation hidden among emergent plants in the water.	**High Potential.** Known to occur onsite. Nesting habitat present.
Tricolored Blackbird *Agelaius tricolor*	BCC, SSC	Resident though wanders during non-breeding season; highly colonial during breeding season. Usually nests near freshwater in dense cattails, tule, or thickets of willow, blackberry, wild rose, or other tall herbs.	**Low Potential.** Unlikely to nest onsite. No records of this species onsite. Humboldt County falls outside the current species' range. Incidentals in county but overall rare.
Golden Eagle *Aquila chrysaetos*	CFP, BCC	Found in rolling foothill and montane habitats, including sage-juniper flats, deserts, and oak woodlands. Cliff-walled canyons provide nesting habitats in most of its range; also nests in large, often isolated trees.	**Moderate Potential.** Unlikely to nest onsite. While known to occur onsite on occasion, nesting habitat not sufficient. Occurrences likely restricted to foraging, migrating, or wintering individuals.
Great Egret *Ardea alba*	none	Colonial nester in large trees; rookery sites located near marshes, tide-flats, irrigated pastures, and margins of lakes and rivers.	**High Potential.** Known to occur onsite. Unlikely to nest at the site due to a lack of large trees. Site serves as foraging habitat however.
Great Blue Heron *Ardea herodiasn*	none	Colonial nester in tall trees, cliff sides, and sequestered spots in marshes; rookery sites in close proximity to forage grounds in marshes, lake margins, tide-flats, rivers, and wet meadows.	**High Potential.** Known to occur onsite. Unlikely to nest at the site due to a lack of large trees. Site serves as foraging habitat however.
Short-eared Owl *Asio flammeus*	SSC	Found in swamp/marsh lands, both fresh and salt; lowland meadows; irrigated alfalfa fields. Tule patches/tall grass needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	**High Potential.** Known to occur onsite year-round. Nesting and foraging habitat present onsite.
Burrowing Owl *Athene cunicularia*	BCC, SSC	Open, dry annual or perennial grasslands, deserts & scrublands characterized by low-growing vegetation. Subterranean nester, dependent upon burrowing mammals, most notably, the California ground squirrel.	**Moderate Potential.** Unlikely to nest onsite. Although known to occur onsite, occurrences likely restricted to migrating or wintering individuals.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Vaux's Swift *Chaetura vauxi*	SSC	Redwood, Douglas-fir, & other coniferous forests. Nests in large hollow trees & snags. Often nests in flocks. Forages over most terrains & habitats but shows a preference for foraging over rivers and lakes.	**High Potential.** Known to forage onsite. Unlikely to nest at the site due to a lack of suitable nest trees.
Western Snowy Plover *Charadrius alexandrinus nivosus*	BCC, SSC, FT	Sandy beaches, salt pond levees, gravel bars, and shores of large alkali lakes. Nests on sandy, gravelly, or friable soils.	**High Potential.** Known occurrence on dunes within the Project area, including nesting.
Northern Harrier *Circus cyaneus*	SSC	Coastal salt & fresh-water marsh. Nests & forages in grasslands on ground in shrubby vegetation, usually at marsh edge; nest built of a large mound of sticks in wet areas.	**High Potential.** Known to occur onsite year-round. Nesting and foraging habitat exist within the Project boundary.
Western Yellow-billed Cuckoo *Coccyzus americansu occidentalis*	SE, FT	Dense riparian habitat. Nests in riparian jungles of willow, often mixed with cottonwoods, w/ lower story of blackberry, nettles, or wild grape.	**Moderate Potential.** No records of species onsite but records at riparian areas around site. Riparian habitat on site (~10 acre riparian woodland patch at very northern end of site) could serve as foraging and breeding habitat.
Snowy Egret *Egretta thula*	none	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.	**High Potential.** Known to occur onsite as a year-round resident.
White-tailed Kite *Elanus leucurus*	CFP	Roosts communally during the non-breeding season. Prefers to nest in trees in open country or on the edge or a forest/wooded area. Forages in open country including grasslands, marshes, savannas, meadows, and cropland.	**High Potential.** Known to forage and nest onsite.
Peregrine Falcon *Falco peregrinus*	BCC, FD, SD, CFP	Near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; also, human-made structures. Nest consists of a scrape or a depression or ledge in an open site.	**Moderate Potential.** While observed onsite on occasion, nesting habitat not sufficient at EREP. Occurrences likely restricted to foraging, migrating, or wintering individuals.
Tufted Puffin *Fratercula cirrhata*	SSC	Open-ocean bird; nests along the coast on islands, islets, or (rarely) mainland cliffs. Requires sod or earth into which the birds can burrow, on island cliffs or grassy island slopes.	**Low Potential.** Marine habitat not present onsite, no records near the site. Closest record is the north spit.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Bald Eagle *Haliaeetus leucocephalus*	FD, SE, BCC, CFP	Lower montane coniferous forest, typically old growth. Ocean shore, lake margins, & rivers for both nesting & wintering. Most nests within 1 mi of water.	**Moderate Potential.** Unlikely to nest onsite. While known to occur onsite on occasion, nesting habitat not sufficient at EREP. Occurrences likely restricted to foraging, migrating, or wintering individuals.
Caspian Tern *Hydroprogne caspia*	BCC	Nests on sandy or gravely beaches and shell banks in small colonies inland and along the coast. Inland fresh-water lakes and marshes; also, brackish or salt waters of estuaries and bays.	**Moderate Potential.** Observed onsite on occasion. Potential breeding habitat along beach/dunes on western edge of Project site. Potential foraging habitat on property.
Black-crowned Night Heron *Nycticorax nycticorax*	none	Colonial nester, usually in trees, occasionally in tule. Rookery sites located adjacent to foraging areas; lake margins, mud-bordered bays, marshy spots.	**High Potential.** Known to forage year-round onsite. Breeders documented in area surrounding site. Riparian habitat onsite (particularly ~10 acre riparian woodland patch at very northern end of site) could serve as breeding habitat.
Osprey *Pandion haliaetus*	none	Ocean shore, bays, fresh-water lakes, and larger streams. Large nests built in tree-tops within 15 miles of a good fish-producing body of water.	**Moderate Potential.** Unlikely to nest onsite. While known to occur onsite on occasion, nesting habitat not sufficient onsite. Occurrences likely restricted to foraging, migrating, or wintering individuals.
Brown Pelican *Pelecanus occidentalis*	FD, SD, CFP	Colonial nester on coastal islands just outside the surf line. Nests on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. Roosts communally.	**Low Potential.** Observed passing through site. Marine cliffs/rocks not present onsite for nesting however.
Double-crested Cormorant *Phalacrocorax auritus*	none	Colonial nester on coastal cliffs, offshore islands, & along lake margins in the interior of the state. Nests along coast on islets, usually on ground with sloping surface, or in tall trees along lake margins.	**Moderate Potential.** Observed passing through site. May forage onsite. Marine cliffs/rocks not present onsite for nesting however.
Black-capped Chickadee *Poecile atricapillus*	none	Gregarious species that associates in species-specific or mixed species flocks during the winter. Found in a variety of wooded/shrubby habitats including forests, woodlots, riparian, and residential areas. Requires small tree cavities for nesting.	**Moderate Potential.** Observed onsite although nesting habitat is low with few suitable cavity trees.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Bank Swallow *Riparia riparia*	ST	Colonial nester; nests primarily in riparian and other lowland habitats west of the desert. Requires vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, ocean to dig nesting holes.	**Moderate Potential.** Observed on properties around site. Suitable nesting habitat not present on Project site. Site could serve as foraging habitat however.
Allen's Hummingbird *Selasphorus sasin*	BCC	Breeds in coastal lowlands of the Upper Sonoran and Transition life zones. Prefers coastal sage scrub, soft chaparral, ravines & canyons, broken coastal forests, oak woodlands, & riparian-lined watercourses.	**Moderate Potential.** Observed onsite. Site contains nectar plants that serve as food sources. Riparian habitat on site (~10 acre riparian woodland patch at very northern end of site) could serve as foraging and breeding habitat.
Yellow Warbler *Setophaga petechiaa*	SSC, BCC	Riparian associations in close proximity to water. Also nests in montane shrubbery in open conifer forests in Cascades and Sierra Nevada. Frequently found nesting and foraging in willow shrubs and thickets, and in other riparian plants including cottonwoods, sycamores, ash, and alders.	**Moderate Potential.** Records at riparian areas around site. Riparian habitat on site (particularly ~10 acre riparian woodland patch at very northern end of site) could serve as foraging and breeding habitat.
FISH			
Green Sturgeon *Acipenser medirostris*	FT, SSC	These are the most marine species of sturgeon. Abundance increases northward of Point Conception. Spawns in the Sacramento, Klamath, & Trinity Rivers. Spawns at temps between 8-14 ˚C. Prefers spawning substrate of large cobble, but can range from clean sand to bedrock.	**Low Potential.** Marine and large riverine habitat is not present on the Project site.
Tidewater Goby *Eucyclogobius newberryi*	FE, 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 & high oxygen levels.	**High Potential.** This species has been documented within the Project area, and presence is assumed within brackish water habitat.
Coast Cutthroat Trout *Oncorhynchus clarkii clarkii*	SSC	Small coastal streams from the Eel River to the Oregon border. Small, low gradient coastal streams & estuaries. Need shaded streams with water temps <18 degrees Celsius, & small gravel for spawning.	**High Potential.** This species has been documented in the Eel River estuary as well as tributaries of the Salt River.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Southern OR / Northern CA Coast Coho Salmon *Oncorhynchus kisutch*	FT	Anadromous, spending time in the ocean, and spawning in coastal rivers and creeks.	**High Potential.** This species is assumed to be present in tidal portions of the Project area; recent records from the adjacent lower Salt River.
Chinook Salmon *Oncorhynchus tshawytscha*	FT, RP, NMFS	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The CA Coast ESU includes naturally spawned populations from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive).	**High Potential.** The species is assumed to be present in tidal portions of the Project area; recent records from the adjacent lower Salt River.
Steelhead - northern CA ESU *Oncorhynchus mykiss*	FT, NMFS, SSC	Anadromous, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The federal designation refers populations occurring below impassable barriers in coastal basins from Redwood Creek to, and including, the Gualala River. Adults migrate upstream to spawn in cool, clear, well-oxygenated streams. Juveniles remain in fresh water for one or more years before migrating downstream to the ocean.	**High Potential.** The species is assumed to be present in tidal portions of the Project site; recent records from the adjacent lower Salt River.
Longfin Smelt *Spirinchus thaleichthys*	FC, ST, SSC	Euryhaline, nektonic, & anadromous. Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 ppt, but can be found in completely freshwater to almost pure seawater.	**High Potential.** The species is assumed to be present in low numbers in tidal areas and seasonally in lower segments of accessible freshwater streams.
Eulachon *Thaleichthys pacificus*	FT	Found in Klamath River, Mad River, Redwood Creek and in small numbers in Smith River & Humboldt Bay tributaries. Spawn in lower reaches of coastal rivers w/ moderate water velocities & bottom of pea-sized gravel, sand & woody debris.	**Low Potential.** Not known from recent nearby samples and typically found farther north, however potentially suitable habitat is present.
REPTILES AND AMPHIBIANS			
Pacific Tailed Frog *Ascaphus truei*	SSC	Occurs from Mendocino County and north, in cold permanent streams, usually in forested areas of high precipitation.	**No Potential.** The Project area does not contain high-gradient stream habitat.

Species	Status[1]	Habitat Requirements	Potential to Occur On-site
Western Pond Turtle *Emys (Actinemys) marmorata*	SSC	An aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches, usually with aquatic vegetation, below 6000 ft elevation. Need basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 km from water for egg-laying.	**Moderate potential.** Suitable habitat is present; however presence may be limited by cool coastal temperatures.
Northern Red-legged Frog *Rana aurora*	SSC	Associated with quiet perennial to intermittent ponds, stream pools and wetlands. Prefers shorelines with extensive emergent and/or riparian vegetation. Documented to disperse through upland habitats after rains.	**Present.** Observed in and near fresh water portions of the Project area; breeding has been documented.

1) Key to status codes:

FE = Federal Endangered
FT = Federal Threatened
FC = Federal Candidate
FD = Federal De-listed
BCC = USFWS Birds of Conservation Concern
SE = State Endangered
SD = State Delisted
ST = State Threatened
SR = State Rare
SSC = CDFW Species of Special Concern
CFP = CDFW Fully Protected Animal
WBWG = Western Bat Working Group High or Medium Priority species

Potential to Occur:

No Potential. Habitat on and adjacent to the site is clearly unsuitable for the species requirements (cover, substrate, elevation, hydrology, plant community, site history, disturbance regime).

Low Potential. Few of the habitat components meeting the species requirements are present, and/or the majority of habitat on and adjacent to the site is unsuitable or of very poor quality. The species is not likely to be found on the site.

Moderate Potential. Some of the habitat components meeting the species requirements are present, and/or only some of the habitat on or adjacent to the site is unsuitable. The species has a moderate probability of being found on the site.

High Potential. All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the site is highly suitable. The species has a high probability of being found on the site.

Table compiled from the California Department of Fish and Wildlife (CDFW) Natural Diversity Database, U.S. Fish and Wildlife Service (USFWS) Species Lists, and California Native Plant Society (CNPS) Electronic Inventory searches of the Tyee, Arcata North, Arcata South, Eureka, Trinidad, Panther Creek, Blue Lake, Korbel, and Cranell USGS 7.5 Minute Quadrangles (CDFW 2016; USFWS 2016). Potential to occur is determined based on habitat availability and nearest known documented records as well as limited site specific information including annual Christmas bird counts, USFWS/ snowy plover counts, CDFW/GHD frog surveys, limited fish sampling data, and incidental observations made during site visits by GHD and HTH.

Cooper's Hawk (*Accipiter cooperii*), no special status. Moderate Potential. Cooper's Hawks are year-round residents across most temperate areas in North America. In California, migrants from more northern climes (southern Canada) pass through the state during the fall months (August-November). Some of these northern populations of Cooper's Hawks likely winter in the state. Cooper's Hawks may be found in a variety of forested habitats included deciduous, mixed, or evergreen forests in urban, suburban, or rural areas. Cooper's Hawk populations have increased over the past few decades in urban and suburban areas, likely as a result of readily available/growing prey populations in these habitats (e.g., European Starling and Rock Pigeon flocks). Cooper's Hawks build their nests in any number of tree species including pines, oaks, firs, eucalyptus, etc. Nest site selection is most likely related to dense prey availability in the surrounding area as well as canopy cover and the adjacent habitat structure. Their nests are constructed out of sticks and bark flakes and may be built on top of existing squirrel or other raptor nests. Cooper's Hawks prey on a variety of small bird and mammal species including European Starlings, Mourning Doves, Rock Pigeons, deer mice, squirrels, and hares (Curtis et al. 2006). The site contains a few large spruce trees and deciduous riparian trees species that could serve as foraging and breeding habitat for Cooper's Hawks. However, overall habitat is subprime for the species as moderate to large-sized trees are few in number on the site. Based on available data, the presence of any established breeders is unlikely and would require onsite surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage onsite.

Sharp-shinned Hawk (*Accipiter striatus*), no special status. Moderate Potential. Sharp-shinned Hawks are year-round residents across most densely forested areas of western and eastern North America. In California, migrants from more northern climes (southern Canada) pass through the state during the fall months (August-November). Some of these northern populations of Sharp-shinned Hawks winter in the state. Sharp-shinned Hawks may be found in a variety of forested habitats including coniferous forests, deciduous forests, woodlots, and transitional/forested edges. They prefer to nest in dense stands of a diversity of tree species. Nests are constructed out of dead twigs and placed against a tree trunk on a horizontal limb. Sharp-shinned Hawks primarily prey on small forest birds and mammals. In more urban/developed areas, Sharp-shinned Hawks hunt at bird feeders (Bildstein and Meyer 2000). The parcel contains a few large spruce trees on an island north of the tidegates, and deciduous riparian trees species that could serve as foraging and breeding habitat for Sharp-shinned Hawks. However, the habitat is overall subprime for the species (moderate to large-sized trees are few in number overall on the site). Based on available data, the presence of any established breeders at the site is unlikely and would require surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage within the Project area.

Western Grebe (*Aechmophorus occidentalis*), USFWS Birds of Conservation Concern. High Potential. Western Grebes are year-round residents in most of California located west of the Sierras. East of the Sierras, Western Grebe populations are comprised of either seasonal breeders or migrants. During the breeding season, Western Grebes favor open fresh water lakes and marshes with emergent vegetation. During the winter, the grebes are commonly found in coastal areas including estuaries and brackish bays. Western Grebes nest colonially in flooded emergent vegetation such as bulrushes or cattails. Nests are comprised of a pile/mat of stems and algae that may either be anchored to emergent vegetation or floating in the water. Western Grebes are strictly piscivores (LaPorte et al. 2013). The site contains open water and nesting substrate that could serve as foraging and breeding habitat for Western Grebes. The presence of any established colonies at the site is currently unknown and would require surveys to confirm. However, based on

historical records and available habitat, the species has a high potential to be present, forage on, and nest within the Project Area.

Golden Eagle (*Aquila chrysaetos*), CDFW Fully Protected, USFWS Birds of Conservation Concern. Moderate Potential. Golden Eagles are found almost exclusively in western North America (west of the 100th meridian), with the exception of a few breeding populations in central and eastern Canada (Labrador and Quebec). Golden Eagles are one of the most heavily researched raptor species in the western U.S. Recent research on this species concerns the effect that renewable energy (i.e. wind turbines) is having on eagle populations. Golden Eagles favor wide open habitats such as woodlands, clear cuts, steppe, shrubland, and tundra with associated nest substrate (cliff/canyon ledges or large trees). The eagles construct their nests out of large sticks and branches and line them with leaves, moss, bark, or grass. The nests are quite large in size (up to 1.5 m in diameter) and may be re-used from year to year. Golden Eagles feed on small to medium sized mammals, snakes, birds, and carrion (Kochert et al. 2002). The parcel contains a few medium-sized spruce (~50 feet tall) that could serve as nest trees for Golden Eagles. However, the nesting habitat is overall subprime for the species (moderate to large-sized trees are overall few in number on the site). Overall, the open nature of the site provides better foraging habitat for wintering eagles. Based on available data, the presence of any established breeders at the site is unlikely and would require surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage within the Project area.

Great Egret (*Ardea alba*), no special status. High Potential. Great Egrets are year-round residents in western California, with breeders concentrated in the Klamath and Warner basin in Siskiyou and Modoc Counties, along the coast in Humboldt County, the San Francisco Bay area, Monterey County, the Salton Sea, and the Central Valley. In term of habitat, they favor wetlands, estuaries, lakes, rivers, ponds, swamps, streams, marshes, and tidal flats. Great Egrets utilize a variety of substrates for nesting including trees, woody vegetation, artificial nest platforms, or even the ground either over water, on islands, or directly adjacent to water. Nests platforms are typically constructed of locally available sticks and greenery. Great Egrets nests communally with conspecifics or in mixed-species colonies. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals (Mccrimmon, Jr. et al. 2011). The parcel does contain wetland, marsh, and estuarine habitat, which could serve as foraging habitat for Great Egrets. However, the lack of large nest trees on the property restricts the chance of breeding onsite. Based on available data, the presence of any established colonies at the site is unlikely and would require surveys to confirm. However, based on historical records and available habitat, the species has a high potential to be present and forage within the area.

Great Blue Heron (*Ardea herodias*), no special status. High Potential. Great Blue Herons are year-round residents in the majority of coastal and central California. Notable exceptions include the Sierras and the very southeastern desert regions of the state. Great Blue Herons are extremely adaptable to a variety of habitats including most saltwater and freshwater bodies, agricultural land, swamps, wetlands, as well as commercial and residential areas such as golf courses. Nesting habitat includes trees, bushes, artificial structures, or the ground adjacent to a water body. Nests platforms are typically constructed out of locally available sticks and lined with material such as grass, moss, and reeds. Great Blue Herons are colonial nesters. They are opportunistic foragers, wading in shallow water to feed on fish, amphibians, and invertebrates. They also hunt on shore for reptiles, birds, and small mammals. Additionally, they are known to scavenge carrion (Vennesland and Butler 2011). The parcel does contain wetland, marsh, and estuarine habitat, which could

serve as breeding habitat for Great Blue Herons. However, the lack of large nest trees on the property restricts the chance of breeding onsite. Based on available data, the presence of any established colonies at the site is unlikely and would require surveys to establish presence. However, based on historical records and available habitat, the species has a high potential to be present and forage within the Project area.

Short-eared Owl (*Asio flammeus*), CDFW Species of Special Concern. High Potential. Short-eared Owls are a widely distributed raptor species, with year-round residents in most of northern California (north of the San Francisco Bay), and seasonal wintering birds throughout most of the rest of the state. Short-eared Owls are associated with open habitat such as agricultural areas, tundra, prairies, and shrub-steppe. Many of these habitats are declining due to land conversion, wetland destruction, and monotypic farming. Short-eared Owls have been designated as a state species of special concern in California, with further research necessary to determine the actual state-wide status of the species. In terms of nesting habitat, Short-eared Owls prefer to nest on the ground in dense grasslands, marshes, or on elevated areas of tundra. Nests consist of a scrape lined with grass and down feathers. Prey items include small mammals such as voles and birds (Wiggins et al. 2006). The parcel does contain marsh and grassland habitat that could serve as breeding habitat for Short-eared Owls. Based on available data, the presence of any established breeders at the site is currently unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a high potential to be present, forage on, and nest within the Project area.

Burrowing Owl (*Athene cunicularia*), CDFW Species of Special Concern. Moderate Potential. Burrowing Owls are found in many grasslands and arid regions of western North and Central America. There are also populations in Florida and the Caribbean. In California, Burrowing Owls are found year-round south of the San Francisco Bay, with seasonal breeders to north and east of this area. Burrowing Owls are declining in many areas as a result of agricultural activities, pesticides, and habitat loss. Burrowing Owls prefer grassland, steppe, and desert habitats as well as other open/developed landscapes such as golf courses, cemeteries, and airports. Burrowing Owls typically nest in burrows created by other animals such as badgers, prairie dogs, or skunks. They may also excavate their own burrows or use artificial burrows. Burrowing Owls feed on insects, small mammals, reptiles, and amphibians (Poulin et al. 2011). The parcel contains open grassland that could serve as foraging and breeding habitat for Burrowing Owls. However, Burrowing Owls have only been detected on this property during the winter and therefore are more likely using the area as a foraging and wintering site. Based on available data, the presence of any established breeders at the site is unlikely and would require surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage within the Project area during winter months.

Vaux's Swift (*Chaetura vauxi*), CDFW Species of Special Concern. High Potential. Vaux's Swifts are summer residents in California, breeding on the coast from central California northward and in the Cascades and Sierra Nevada mountains. Nesting occurs in large, accessible, chimney-like tree cavities that allow birds to fly within the cavity directly to secluded nest sites. Such cavities usually occur in conifers, particularly redwoods. Chimneys and similar man-made substrates are also used for nesting. This species is highly aerial and forages widely for insects in open airspace. During migration, nocturnal roosting occurs communally; favored roosts may host thousands of individuals (Bull and Collins 2007). The parcel does not contain large conifers with large, vertical-oriented cavities, and thus does not provide suitable breeding habitat. However such habitat is available along Centerville Road. Thus this species has a high potential to forage within the Project area.

Western Snowy Plover, Federally Threatened, USFWS Birds of Conservation Concern, CDFW Species of Special Concern. High Potential. Snowy Plovers are year-round residents in pockets along the California coast as well as the San Joaquin Valley and Salton Sea. There are also seasonal breeding populations in northeastern California and the eastern edge of the San Joaquin Valley. During the 20th century, the breeding range along the California coast became extremely fragmented. Habitat loss is one of numerous threats to the species. Other threats include but are not limited to human disturbance, predation by species associated with human development (i.e. corvids), and pesticides/inorganic contaminants. Snowy Plovers favor open coastal beaches with sparse vegetation, gravel bars in rivers, agricultural wastewater ponds, evaporation ponds, and barrier islands. Nesting microhabitat within these larger features include: open ground in/adjacent to driftwood, beached kelp, small plants, cow patties, or other conspicuous items in an otherwise barren landscape. Nests consist of a depression/scrape in the ground lined with small items such as shell fragments, fish bones, pebbles, and bits of vegetation. Snowy Plovers are territorial during the breeding season but gregarious during the winter and when foraging. Snowy Plovers feed on a variety of invertebrates including but not limited to crabs, beetles, amphipods, insect larvae, flies, and caterpillars (Page et al. 2009). There is an existing breeding population located on the dunes within the Project area, thus, the species has a high potential to remain present, forage on, and nest within the site.

Northern Harrier (*Circus cyaneus*), CDFW Species of Special Concern. High Potential. Northern Harriers are a widely distributed raptor species, with year-round residents on the California coast, northeastern portion of the state, and the Central Valley. They are seasonal breeders throughout most of the rest of the state. Northern Harriers are associated with open habitat such as meadows, grazing land, marshes, tundra, prairies, riparian woodlands, and shrub-steppe. Many of these habitats are declining due to land conversion, wetland destruction, and monotypic farming. This being the case, Northern Harriers have been designated as a state species of special concern in California, with further research necessary to determine the actual state-wide status of the species. In terms of nesting habitat, Northern Harriers prefer to nest on the ground in vegetated uplands or wetlands. Nests consist of a large grass-lined cup surrounded by tall and dense vegetation such as reeds, willows, or blackberry bushes. Northern Harriers are polygynous, with one male frequently supporting/providing food for multiple nesting females. Prey items include: rodents, birds, reptiles, and amphibians (Smith et al. 2011). The site contains wetland, marsh, and grassland habitat, which could serve as breeding habitat for Northern Harriers. Based on available data, the presence of any established breeders at the site is currently unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a high potential to be present, forage on, and nest within the Project area.

Western Yellow-billed Cuckoo (*Coccyzus americansu occidentalis*), Federally Threatened, State Endangered. Moderate Potential. The Western Yellow-billed Cuckoo exists in small riparian pockets in California, Arizona, Idaho, Colorado, Montana, Utah, and New Mexico, and Wyoming. In California, the largest breeding populations are in the Central Valley. The species experienced precipitous population declines in the 20th century due to riparian habitat loss and eggshell thinning (declined from 15,000 pairs to 40 in California). In 2014, the western population was designed as Federally Threatened under the Endangered Species Act (ESA). Western Yellow-billed Cuckoos prefer scrubby/riparian vegetation associated with water courses, thickets, successional hardwood forests, abandoned agricultural land, and desert riparian woodland. Cuckoos build their nests in trees (willows, alder, etc.) roughly 10 meters off the ground in dense riparian vegetation. Nests are constructed out of twigs and lined with leaves, bark, and plant material. Cuckoos feed on insects, amphibians, lizards, eggs, fruit, seeds, and young birds

(Hughes 2015). The parcel does contain riparian habitat (~10 acres at the very northern end of the property) that could serve as breeding habitat for Western Yellow-billed Cuckoos. While no Cuckoos have been reported at the site, they have been observed during the breeding season in the surrounding area (i.e. occasional sightings on Cock Robin Island in Loleta, CA and along the Salt River in Ferndale, CA). Based on available data, the presence of any established breeders at the site is currently unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a moderate potential to be present, forage on, and nest within the Project area.

Snowy Egret (*Egretta thula*), no special status. High Potential. Snowy Egrets were hunted to the brink of extinction by the plume trade at the end of the 19th and beginning of the 20th century. However, many populations rebounded after the Migratory Bird Treaty Act was passed in 1918. Year-round populations of Snowy Egrets are found around Humboldt Bay, the San Francisco Bay area, the Central Valley, and the Salton Sea. Wintering populations are also located along much of the rest of the California coast. Snowy Egrets prefer riparian and estuarine areas, marshes, wet meadows, inland lakes, and river courses. Snowy Egrets construct stick nest platforms in a variety of tree and shrub species including: willows, holly, birch, and wax myrtle. Nests are lined with reeds, grasses, and moss. Snowy Egrets are colonial nesters, with colonies comprised of both conspecifics and allospecifics. Snowy Egrets hunt in shallow water and on shore, frequently making using of their distinctly yellow feet to attract and capture prey items. Prey includes fish, amphibians, snakes, lizards, crustaceans, insects, and worms (Parsons and Master 2000). The parcel does contain woody vegetation adjacent to wetland, marsh, and estuarine habitat, which could serve as breeding habitat for Snowy Egrets. Based on available data, the presence of any established colonies at the site is currently unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a high potential to be present, forage on, and nest within the Project area.

White-tailed Kite (*Elanus leucurus*), CDFW Fully Protected. High Potential. White-tailed Kites are year-round residents in most of California west of the Sierras including the majority of the coastal foothills, Central Valley, and some arid regions such as Kern and Inyo Counties. White-tailed Kites prefer open landscapes at low elevations including marshes, grasslands, oak-woodlands, savannahs, and agricultural land. Nests are typically constructed on habitat edges in the upper third portion of a tree or bush. Nests consist of small sticks, grass, hay, and leaves placed in a variety of tree or shrub species including coastal redwoods, Sitka spruce, or brooms. White-tailed Kites feed almost exclusively on small mammals captured via hover hunting (Dunk 1995). The parcel does contain agricultural, marsh, and grassland habitat with trees/shrubs, which could serve as breeding habitat for White-tailed Kites. Based on available data, the presence of any current established breeders at the site is unknown and would require surveys to confirm. However, based on historical records (nesting in 2013, Sean McAllister personal communication) and available habitat, the species has a high potential to be present, forage on, and nest within the Project area.

Peregrine Falcon (*Falco peregrinus*), Federally Delisted, State Delisted, USFWS Birds of Conservation Concern, CDFW Fully Protected. Moderate Potential. Peregrine Falcons received significant attention during the middle of the 20th century due to precipitous population declines. These population crashes have been attributed to the lethal and sub-lethal effects of the organochlorine pesticide DDT. After DDT was banned in 1972, the Peregrine Falcon started to rebound nationwide. Breeding populations of Peregrines are found along the coast of California and the majority of the interior of the state, excluding the Central Valley and arid regions in the southeast. Peregrines generally prefer for open landscapes for foraging and cliffs for breeding.

Nests consist of a scrape in sand, gravel, or dirt on a cliff ledge, artificial nest boxes, or abandoned raptor or corvid nests. Peregrine Falcons feed primarily on other avian species including passerines, waterfowl, and shorebirds. They have also been known to take amphibians, fish, and mammals (White et al. 2002). The site does not contain any old corvid nests or offshore rocks that could serve as breeding habitat for Peregrines. Based on available data, the presence of any established breeders at the site is unlikely and would require onsite surveys to confirm. However, based on historical records and available habitat, the species has a moderate potential to be present and forage within the area.

Bald Eagle (*Haliaeetus leucocephalus*), State Endangered, Federally Delisted, USFWS Birds of Conservation Concern, CDFW Fully Protected. Moderate Potential. Bald Eagles received significant attention during the middle of the 20th century due to precipitous population declines. These population crashes have been attributed to the lethal and sub-lethal effects of the organochlorine pesticide DDT. After DDT was banned in 1972, Bald Eagles rebounded nationwide. In California, Bald Eagle breeding is restricted primarily to the northern portion of the state, with a few breeding populations along the coast south of San Luis Obispo and on the Channel Islands. Bald Eagles are found in forested areas adjacent to lakes, rivers, estuaries, and dams, with nests in large trees, cliffs, or on the ground in treeless regions. Platform nests are constructed out of large sticks and lined with grass, moss, down feathers, and other soft vegetation. Bald Eagles are opportunistic feeders, taking fish, waterfowl, mammals, and even carrion during the winter (Buehler 2000). The parcel contains open water that could serve as foraging habitat for Bald Eagles. Most sightings of Bald Eagles at the site are during the winter, suggesting that the site may be used exclusively for winter foraging. Based on available data, the presence of any established breeders at the site is unlikely but would require surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage within the Project area.

Caspian Tern (*Hydroprogne caspia*), USFWS Birds of Conservation Concern. Moderate Potential. Caspian Terns are found along coastlines, lakes, and inlets throughout North America. In California, these Terns largely breed along the coast from the Oregon border to Point Conception, although there is a seasonal breeding population around Lake Tahoe. Many wintering populations exist along the Southern California coast. Habitat preferences include lakes, rivers, estuaries, shorelines, sloughs, lagoons, and occasionally open ocean. Caspian Terns favor islands in river and lakes, coastal estuarine habitat, salt marsh, and barrier islands for nesting with sandy, pebble, or gravel beaches. Nests consist of a depression/scrap in the sand/gravel lined with dried vegetation, shells, pebbles, and other debris. Terns feed on fish, crayfish, and insects (Cuthbert and Wires 1999). The site does contain coastal dune/beach habitat as well as estuarine habitat that could serve as breeding and foraging areas for Caspian Terns. Based on available data, the presence of any current established breeders at the site is unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a moderate potential to be present, forage on, and nest to the west of the Project along coastal areas of the site.

Black-crowned Night Heron (*Nycticorax nycticorax*), no special status. High Potential. Black-crowned Night Herons are year-round residents in much of California, with notable exceptions in the Sierras, Central Valley, and the arid southeast portion of the state. These herons can be found in a wide variety of habitats adjacent to water bodies including urban, wetland, partially forested, and agricultural landscapes. Black-crowned Night Herons are colonial nesters, building platform stick nests in trees, reeds, cattails, bushes, or on the ground. As opportunistic feeders, Black-crowned Night Herons eat fish, insects, mammals, birds, carrion, trash, clams, crayfish, turtles, and

many other food items (Hothem et al. 2010). Based on available data, the presence of any established colonies at the site is currently unknown. However, based on historical records and available habitat, the species has a high potential to be present, forage on, and nest within the Project area.

Osprey (*Pandion haliaetus*), CDFW Watch List. Moderate Potential. Osprey are distributed along much of coastal California with breeding populations from Del Norte to San Mateo Counties with wintering populations located from Santa Cruz County south to the Mexican border. A few wintering populations are located on large bodies of water away from the coast (e.g., the Salton Sea and large reservoirs stocked with fish). Osprey prefer forested or coastal habitat adjacent to large bodies of shallow water in temperate or tropical climes. Large platform stick nests are constructed in a variety of large tree species and on artificial nest platforms, power poles, and cliffs. In terms of prey, Osprey are strictly piscivores (Poole et al. 2002). The site contains open water and nesting structures that could serve as foraging habitat for Osprey. However, the lack of large trees/structures on the site makes the habitat subprime for nesting. Based on available data, the presence of any established breeders on the site is unlikely and requires surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to be present and forage within the Project area.

Double-crested Cormorant (*Phalacrocorax auritus*). CDFW Watch List. Moderate Potential. Double-crested Cormorants are year-round residents along most of the California coast and some inland areas such as the Salton Sea, Central Valley, and Colorado River. Cormorants are associated with aquatic environments such as coastal or aquaculture areas with suitable roosting and loafing sites on rocks, pilings, or sandbars. Double-crested Cormorants nests colonially on the ground, cliffs, power poles, rock islands, or trees or shrubs. Nests are composed of small sticks, seaweed, and trash such as rope, balloons, and fishing line. Double-crested Cormorants are primarily piscivores but also will eat crustaceans, insects, eels, and amphibians (Dorr et al 2014). The site contains numerous open habitats that could potentially serve as foraging habitat for Double-crested Cormorants, however, overall habitat is subprime for the species due to a lack of rocks, sandbars, or other nesting and loafing requirements. Based on available data, the presence of any established breeders at the site is unlikely but would require surveys to confirm. However, considering historical records and available habitat, the species has a moderate potential to occur and forage within the Project area.

Black-capped Chickadee (*Poecile atricapillus*), CDFW Watch List. Moderate Potential. Black-capped Chickadees are found year-round in the very northwest corner of California (Del Norte and Humboldt Counties). Black-capped Chickadees are found in mixed and single species flocks during the non-breeding season and can be seen defending territories during the breeding season. The species prefers fragmented wooded areas such as woodlots, parks, and riparian corridors, but also continuous deciduous and mixed forests. Chickadees are cavity nesters that particularly favor hardwoods. After the cavity has been excavated, females line the interior of the tree cavity with moss, mammal fur, or grasses. Black-capped Chickadees prefer to feed on insects, spiders, seeds, and berries during the winter and breeding seasons (Foote et al. 2010). The site contains few trees that could serve as breeding habitat. Based on available data, the presence of any established breeders at the site is unknown and would require surveys to confirm. However, based on historical records and available habitat, the species has a moderate potential to be present, forage on, and nest within the Project area.

Bank Swallow (*Riparia riparia*), State Threatened. Moderate Potential. In North American, Bank Swallows breed in most of North America at low elevations in suitable habitat. Breeding

ranges extend from Alaska to Texas, although most breeding occurs north of 37º. Wintering grounds occur along the western coast of Central America. In California, Bank Swallows are found in Siskiyou, Shasta, Yolo, and Lassen Counties. Bank Swallows favor open habitat associated with water features such as coastlines, streams, rivers, lake banks, wetlands, agricultural areas, prairies, and riparian woodlands. Bank Swallows generally nest colonially along stream/river banks in burrows excavated perpendicular to the bank. These burrows are lined with grasses, straw, leaves, feathers, and other organic material. Bank Swallows capture insects on the wing but will also consume aquatic insects and larvae (Garrison 1999). The site does not contain typically suitable stream/river banks that would serve as nesting habitat for the species. However, the presence of any established breeders at the site is currently unknown and would require surveys to confirm. In contrast, suitable habitat may exist along the Eel River to the northeast of the site and Bank Swallows have been observed in areas adjacent to the site. Therefore, the site likely serves as suitable foraging habitat for Bank Swallows and the species has a moderate potential to be present and forage within the site.

Allen's Hummingbird (*Selasphorus sasin*), USFWS Bird of Conservation Concern. Moderate Potential. Allen's hummingbird, common in many portions of its range, is a summer resident along the majority of California's coast and a year-round resident in portions of coastal southern California. Breeding areas parallel the coastal fog belt and typical habitats used by the species include coastal scrub, riparian, and woodland areas along forest edges (Clark and Mitchell 2013). Allen's hummingbirds feed on nectar as well as insects and spiders. The site provides some forest edge habitat as well as nectar plants that could support the species. As such, the species has a moderate potential to be present and breed onsite.

Yellow Warbler (*Setophaga petechia*), USFWS Bird of Conservation Concern, CDFW Species of Special Concern. Moderate Potential. The Yellow Warbler breeds in northern California along coastal regions all the way to Mexico, as well as inland regions on the eastern side of the Central Valley. However, the entire population winters south of the U.S. border. Yellow Warblers favor riparian willow thickets, disturbed early successional habitats, shrubby wetlands, bogs, wet-deciduous forest, and hedgerows. As such, nesting habitats include a variety of shrub and tree species such as dogwoods, willows, and cottonwoods. Yellow Warblers construct cup nests out of grasses and bark lined with fur, feathers, dandelion fruits, or other seed fibers (Lowther et al. 1999). The site contains suitable riparian habitat that could provide breeding grounds for Yellow Warblers. However, the presence of established breeding pairs at the site is currently unknown and requires surveys to confirm. Therefore, based on historical records and available habitat, the species has a moderate potential to be present, forage on, and nest within the Project area.

Western Pond Turtle (*Emys marmorata*), CDFW Species of Special Concern. Moderate Potential. Based on molecular analysis, Spinks et al (2014) proposed recognizing all pond turtles north of San Francisco Bay as *Emys marmorata*; many available literature sources refer to the species as *Actinemys marmorata*. Pond turtles occur in a variety of permanent and semi-permanent freshwater aquatic habitats including lakes, rivers, ponds, creeks, and marshes. Pond turtles are fairly common a few miles inland in Humboldt County. However, cool summer temperatures along coastal areas may preclude successful breeding. There are no reports to date from the site, and, if present, pond turtles would likely be limited to freshwater or brackish areas. There have been reports of non-breeding animals in coastal marshes on the Samoa Peninsula, and these are believed to be released pets originating from more inland locations (D. Ashton, pers. comm.).

Northern Red-legged Frog (*Rana aurora*), CDFW Species of Special Concern. High Potential. Northern Red-legged Frogs are relatively common in near-coastal portions of Humboldt County and are known to be present in fresh water portions of the site. Breeding has been documented in the duck club ponds (Mierzwa 2013; CDFW 2011) and in a riparian ditch west of the EREP visitor center (Mierzwa 2013), with over 100 egg masses documented in each location in some years (GHD 2014). A single egg mass was reported from the western drainage (CDFW 2011).

Eulachon – southern DPS (*Thalyicthys pacificus*), Federal Threatened. Low Potential. Eulachon are a relatively small anadromous fish, spending three to five years in nearshore saltwater before returning to freshwater in late winter or spring to spawn. Lower reaches of larger rivers with sand or coarse gravel substrates are typically used for spawning. Populations have markedly declined in the past 20 years, and eulachon are thought to be extirpated or nearly so in many northern California rivers. .No recent surveys have documented presence in the estuary, and the range is generally to the north.

Longfin Smelt (*Spirinchus thalyichthys*), State Threatened. High Potential. The longfin smelt is a small, pelagic, estuarine fish and is listed as threatened under the California Endangered Species Act. Most of the approximately two year lifespan is spent in brackish or saline water, while spawning may occur in freshwater. Spawning is generally from January through March (Moyle 2002). Populations are known from The Eel River estuary and from Humboldt Bay, although relatively few individuals have been reported from recent samples; Cannata and Downie (2009) summarized records as far back as the 1950s. Potentially suitable habitat is available within the site. Eight individuals were captured during December 2014 and February 2015 samples of nearby recently restored Salt River and Riverside Ranch locations, suggesting that longfin smelt may be able to colonize portions of EREP after tidal action is restored. The species is assumed to be already present in tidal portions of the site although no detailed information is available.

Steelhead (*Oncorhynchus mykiss*), Federal Threatened/State Threatened. High Potential. Winter-run Northern California steelhead enter fresh water from the ocean between November and April and migrate to spawning areas between April and May. Some adults, however, do not enter coastal streams until spring, just prior to spawning. Spring-run summer steelhead enter freshwater in the spring and summer months, hold in the mainstem and Middle Fork Eel River near the site, and then spawn in fall. Both winter-run and spring-run summer steelhead are found in the Middle Fork Eel River, although Spring-run summer steelhead are rare. Documentation of Spring-run summer steelhead in the lower-Eel River is limited to the Van Duzen River. Spawning and initial rearing of juvenile steelhead generally take place in small, moderate-gradient (generally 3-5 percent) tributary streams (Nickelson et al. 1992). Most of the over summer juvenile steelhead rearing occurs in the upper sections of the estuary near Fernbridge, not within the Project site, which largely restricts fish passage. Most steelhead smolt migration to sea occurs by June, although juveniles may be present in the estuary all year (Cannata and Hassler 1995; Puckett 1968). Winter steelhead populations generally smolt after two years in fresh water.

Steelhead were stocked on an annual basis into Salt River tributaries including Russ Creek and Francis Creek during the 1930's, 1953-1966, and possibly as recently as the 1980's (DFG 1938, CEMAR 2009 2011). Staff from DFG surveyed Russ Creek in 1938 and did not observe *O. mykiss* but noted that natural propogation "should be considerable" in this creek. The survey report notes the presence of "good" spawning areas and "good" pools and shelter (DFG 1938a in CEMAR, 2009). In a 1990 field note, DFG staff wrote that the creek historically supported steelhead and salmon populations, however, "None of these species have been observed for the past few years." The note mentions several limiting factors including passage barriers, bank failures, livestock

damage, and sedimentation (DFG 1990 in CEMAR 2009). Staff from DFG conducted a stream inventory of Russ Creek in 2004. Surveyors did not observe *O. mykiss* in Russ Creek during the survey (CCC 2004). The inventory report recommended that a box culvert at Centerville Road and a dam 496 feet upstream from the road crossing be assessed for fish passage. Steelhead have been documented in Francis Creek as recently as 2005 and have been observed in the sloughs of the Salt River in 1973 and 1995 (Puckett 1973; Cannata 1995). One juvenile steelhead was captured in a recently restored segment of Salt River in March 2016. Steelhead are assumed to be present in tidal portions of the EREP site, including in immediate proximity to the tidegates and the outer side of the levees.

Coho Salmon (*Oncorhynchus kisutch*). Federal Threatened, State Threatened. High Potential. Coho salmon in the site are part of the Southern Oregon Northern California (SONCC) Evolutionary Significant Unit (ESU). General life history information and biological requirements of SONCC coho salmon are described in the NOAA Fisheries' final rule listing SONCC coho salmon (May 6, 1997; 62 FR 24588). Adult Coho salmon typically enter rivers between September and February; entry into the Eel River Estuary is reported to be November to February (Schlosser and Eicher 2012). Spawning occurs from November to January (Hassler 1987), but occasionally as late as February or March (Weitkamp et al. 1995). Coho salmon eggs incubate for 35-50 days between November and March. Fry start emerging from the gravel two to three weeks after hatching and move into shallow areas with vegetative or other cover. As fry grow larger, they disperse up or downstream. In summer, coho salmon fry prefer pools or other slower velocity areas such as alcoves, with woody debris or overhanging vegetation. Juvenile coho salmon over-winter in slow water habitat with cover as well. Juveniles may rear in fresh water for up to 15 months then migrate to the ocean as "smolts" from March to June (Weitkamp et al. 1995). A small percentage (~15 %) may rear in fresh water for a second year. Estuaries are an important transition area and may be occupied for days to months (Schlosser and Eicher 2012); juvenile Coho are known to be present in the Eel River estuary in the winter months. Coho salmon adults typically spend two years in the ocean before returning to their natal streams to spawn as three-year olds. Available historical and modern data are summarized by the NOAA Fisheries status review update (NOAA Southwest Fisheries Science Center 2001), and CDFW's Recovery Strategy for Coho Salmon (DFG 2004). Coho salmon stocks between Punta Gorda and Cape Blanco are depressed relative to past abundance, but there is limited data to assess population numbers and trends. The decline of SONCC Coho salmon is not the result of one single factor, but rather the consequence of a number of natural and anthropogenic factors that include dam construction, instream flow alterations, and land use activities coupled with large flood events, fish harvest, and hatchery effects. However, several Coho salmon juveniles were observed within the city limits of Ferndale in Francis Creek in 2005 and the mainstem Salt River occasionally provides migration habitat for adult coho salmon during higher flows, and juvenile coho were captured in five of nine monthly samples during 2014 and 2015 at the nearby lower Salt River (Ross Taylor and Associates 2015), suggesting that the species is able to readily colonize recently restored habitat. Tributary streams provide potential rearing and spawning habitat for Coho salmon. Russ Creek is similar in size and catchment to Francis Creek, and because of proximity to the lower Eel River estuary it would likely host coho during critical life history patterns if habitat conditions allow. Coho are assumed to be already present in tidal portions of the site including in immediate proximity to the tidegates and levees; pre-Project presence is less likely behind the tidegates but cannot be conclusively ruled out based on the limited sample data available. Captures of considerable numbers of juvenile coho during 2014-2016 monitoring of the nearby Salt River and Riverside Ranch suggests that this species would quickly occupy newly available potential rearing habitat made available by re-establishment of muted tidal action within the Inner Marsh and Centerville Slough.

California Coastal Chinook Salmon ESU (*Oncorhynchus tshawytscha*), Federal Threatened. High Potential. This ESU occurs from Redwood Creek south to the Russian River and includes Chinook in the Eel River watershed. Populations have declined considerably from historic levels. Spawning populations enter the Eel River estuary from August through January (Schlosser and Eicher 2012). Juvenile Chinook are reportedly present in the estuary from spring through fall (Cannata and Hassler 1995), and juveniles have been captured in recent samples from the nearby Salt River Restoration Project; four individuals were captured in February 2014 and additional captures were made in April and July 2014 (Ross Taylor and Associates 2015). Chinook are assumed to be present in the tidal portions of the Project site.

Tidewater Goby (*Eucyclogobius newberryi*), Federal Endangered. High Potential. Tidewater Gobies occur in coastal lagoons, brackish marshes, and estuaries that are seasonally disconnected from tidal action when sand bars form at the ocean's edge (Moyle 2002), or when structures such as culverts or tide gates mute tidal action (Ritter et al. 2008). Storm events that result in sannbar breaches may disperse gobies up to several kilomters from extant populations (Lafferty et al. 1999a, 1999b). Tidewater Gobies have been documented within the EREP Inner Marsh in 2010 and 2012, and in the Western Drainage in 2010 (Kramer 2016). Goby have also been extensively documented within restored Riverside Ranch where the population grew considerably from pre-Project to post-project (A. Renger, pers. comm.) There were 318 individuals captured in 2014-2015 samples, dropping back to seven individuals in 2015-2016 sampling. Wetter conditions with higher flows and lower salinities may have contributed to the lower 2015-2016 numbers (Ross Taylor and Associates 2016). Tidewater Goby life history and presence within the Project area are further described by Kramer (2016), included in Appendix E..

Coastal Cutthroat Trout (*Oncorhynchus clarkia clarkia*), Species of Special Concern. High Potential. The coastal cutthroat trout ranges from the southernmost extent of its range in the Eel River to Prince Williams Sound in Alaska. Life history strategies are more variable than for most salmonids (Moyle 2002) and Trotter (1989, 1997) recognized four main life history groupings including sea run, lacustrine, riverine, and stream resident. Ecological requirements are similar to those of steelhead, and where the two species co-occur coastal cutthroat trout usually occupy smaller tributary streams (CDFG 2010). Unlike most salmon, this species may spawn more than once. Adults commonly enter streams during the fall and feed on the eggs from other salmons' spawn. Spawning can occur from December through May. Young cutthroat may spend up to two weeks in the gravel before emerging and from one to nine years in fresh water before migrating to estuaries and ocean in the spring. Coastal cutthroat trout usually spend less than one year in salt water before returning to spawn. Juveniles and adults are carnivorous, feeding mostly on insects, crustaceans, and other fish throughout their lives. In freshwater, adult cutthroat typically reside in large pools while the young reside in riffles, most commonly in upper tributaries of small rivers. Coastal cutthroat trout utilize a wide variety of habitat types during their complex life cycle. They spawn in small tributary streams, and utilize slow flowing backwater areas, low velocity pools, and side channels for rearing of young. Good forest canopy cover, in-stream woody debris, and abundant supplies of insects are crucial for the young cutthroat's survival. During the estuarine or ocean phase of life, the cutthroat trout utilizes tidal sloughs, marshes, and swamps as holding areas and feeding grounds. Despite widespread decline throughout its range, coastal cutthroat trout are present in the Eel River estuary, the Salt River, and in the Salt River tributary streams (Downie and Lucey 2005). Coastal cutthroat trout were reported from electrofishing surveys of Russ Creek just above Centerville Road in 2004 (CDFG 2004); although no samples were conducted within the Project area, this species is assumed to be present based on occurrence immediately upstream.

The homogenization of the Occidental marsh to pasture, and the removal of overstory significantly reduced habitat quality for this species. The proposed Project would restore the connectivity and habitat that this species depends upon.

3.4.2 Regulatory Framework

Many sensitive biological resources in California are protected and/or regulated by federal, state, and local laws and policies. Those applicable to the proposed Project are summarized below.

Federal

Federal Endangered Species Act

The federal Endangered Species Act of 1973 (ESA) recognizes that many species of fish, wildlife, and plants are in danger of or threatened with extinction and established a national policy that all federal agencies should work toward conservation of these species. The Secretary of the Interior and the Secretary of Commerce are designated in the act as responsible for identifying endangered and threatened species and their critical habitats, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on endangered species. The act also outlines what constitutes unlawful taking, importation, sale, and possession of endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7(c) of the act if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from a federal agency as defined in Part 404.02. Under Section 7(a)(3) of the act, every federal agency is required to consult with USFWS or NOAA Fisheries on a proposed action if the agency determines that its proposed action may affect an endangered or threatened species.

Section 9 of the ESA prohibits the “take” of any fish or wildlife species listed under the ESA as endangered or threatened. Take, as defined by the ESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action." However, Section 10 allows for the “incidental take” of endangered and threatened species of wildlife by non-federal entities. Incidental take is defined by the ESA as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” Section 10(a)(2)(A) requires an applicant for an incidental take permit to submit a “conservation plan” that specifies, among other things, the impacts that are likely to result from the taking and the measures the permit applicant will undertake to minimize and mitigate such impacts. Section 10(a)(2)(B) provides statutory criteria that must be satisfied before an incidental take permit can be issued.

Clean Water Act, Section 404

Proposed discharges of dredged or fill material into waters of the U.S. require USACE authorization under Section 404 of the Clean Water Act (CWA) [33 U.S.C. 1344]. Waters of the U.S. generally include tidal waters, lakes, ponds, rivers, streams (including intermittent streams), and wetlands (with the exception of isolated wetlands). Wetlands subject to the CWA Section 404 are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3 [b]; 40 CFR 230.3 [t]). The USACE identifies wetlands using a "multi-parameter approach," which requires positive wetland indicators in three distinct environmental categories: hydrology, soils, and vegetation.

According to the USACE Wetlands Delineation Manual, except in certain situations, all three parameters must be satisfied for an area to be considered a jurisdictional wetland.

The CWA also defines the ordinary high water mark as the Section 404 jurisdictional limit in non-tidal waters. When adjacent wetlands are present, the limit of jurisdiction extends to the limit of the wetland. Field indicators of ordinary high water include clear and natural lines on opposite sides of the banks, scouring, sedimentary deposits, drift lines, exposed roots, shelving, destruction of terrestrial vegetation, and the presence of litter or debris. Typically, the width of waters corresponds to the two-year flood event.

The 404(b)(1) Guidelines describe exceptions for a general rule that fill should not be discharged in waters of the United States if there is a practicable alternative that would overall have less adverse impact on aquatic resources. They presume that for special aquatic sites like wetlands, practicable alternatives to fill discharges in wetlands are available unless otherwise demonstrated. The Guidelines also prohibit discharges of fill that may cause or contribute to “significant degradation” of U.S. waters, or discharges that may jeopardize a federally listed, endangered, or threatened species. Finally, for approved fill discharges in U.S. Waters, the Guidelines require that practical steps must be taken to minimize impacts (mitigation; Subpart H). The Guidelines require detailed factual determinations (40 C.F.R. Section 230.11, Subparts C-F) to support permit decisions that must comply with the Guidelines, including physical, chemical, and biological impacts, impacts to special aquatic sites (wetlands, mudflats, refuges, vegetated shallows, etc.), and impacts to human uses. These factual determinations identify the specific functions and values of aquatic habitats that must be evaluated for impacts of proposed fill. Permits for fill discharges subject to Section 404 are issued by the USACE, with some programmatic oversight from EPA. The USACE is authorized to issue a Section 404 Permit for the discharge of dredged or fill material into waters of the U.S., provided that such discharges are found to be in compliance with the Sections 401 and 404(b)(1) guidelines published by the EPA.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (50 CFR 10.13) established federal responsibilities for the protection of nearly all species of birds, their eggs and nests. A migratory bird is defined as any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual life cycle. “Take” is defined in the MBTA “to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof.” Only non-native species such as Rock Pigeons (*Columba livia*), House Sparrows (*Passer domesticus*), and European Starlings (*Sturnus vulgaris*) are exempt from protection.

Executive Order 13112, Invasive Species

Executive Order 13112 was issued in 1999 to enhance federal coordination and response to the complex and accelerating problem of invasive species. It provides policy direction to promote coordinated efforts of federal, state, and local agencies in monitoring, detecting, preventing, evaluating, managing, and controlling the spread of invasive species and increasing the effectiveness of scientific research and public outreach affecting the spread and impacts of invasive species.

State

California Environmental Quality Act

Rare or endangered plant or wildlife species are defined in the CEQA Guidelines Section 15380. Endangered means that survival and reproduction in the wild are in immediate jeopardy. Rare

means that a species is either presently threatened with extinction or that it is likely to become endangered within the foreseeable future. A species of animal or plant shall be presumed to be rare or endangered if it is listed in Sections 670.2 or 670.5, Title 14, California Administrative Code; or Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the federal Endangered Species Act as threatened or endangered.

California Endangered Species Act

The California Endangered Species Act (CESA) includes provisions for the protection and management of species listed by the State of California as endangered or threatened or designated as candidates for such listing (Fish and Wildlife Code Sections 2050 through 2085). The act requires consultation "to ensure that any action authorized by a state lead agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of the species" (Section 2053). California plants and animals declared to be endangered or threatened are listed in 14 California Code of Regulations (CCR) 670.2 and 14 CCR 670.5, respectively. The state prohibits the take of protected amphibians (14 CCR 41), protected reptiles (14 CCR 42), and protected furbearers (14 CCR 460). The CDFW may also authorize public agencies through permits or a memorandum of understanding to import, export, take, or possess any endangered species, threatened species, or candidate species for scientific, educational, or management purposes (Section 2081[a]). The CDFW may also authorize, by permit (incidental take permit), the take of endangered species, threatened species, and candidate species provided specific conditions are met (Section 2081[b]).

California Fish and Game Code

The CDFW enforces the California Fish and Game Code (CFGC), which provides protection for "fully protected birds" (Section 3511), "fully protected mammals" (Section 4700), "fully protected reptiles and amphibians" (Section 5050), and "fully protected fish" (Section 5515). With the exception of permitted scientific research, no take of any fully protected species is allowed.

Section 3503 of the CFGC prohibits the take, possession, or needless destruction of the nest or eggs of any bird. Subsection 3503.5 specifically prohibits the take, possession, or destruction of any birds in the orders Falconiformes (hawks and eagles) or Strigiformes (owls) and their eggs or nests. These provisions, along with the federal MBTA, essentially serve to protect nesting native birds. Non-native species, including the European Starling, Rock Dove, and House Sparrow, are not afforded protection under the MBTA or CFGC.

Streams, lakes, and riparian vegetation as habitat for fish and other wildlife species, are subject to jurisdiction by the CDFW under Sections 1600-1616 of the CFGC. Activity that will do one or more of the following, generally require a Section 1602 Lake and Streambed Alteration Agreement: 1) substantially obstruct or divert the natural flow of a river, stream, or lake; 2) substantially change or use any material from the bed, channel, or bank of a river, stream, or lake; or 3) deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it can pass into a river, stream, or lake. The term "stream," which includes creeks and rivers, is defined in the CCR as follows: "a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation" (14 CCR 1.72). In addition, the term stream can include ephemeral streams, dry washes, watercourses with subsurface flows, canals, aqueducts, irrigation ditches, and other means of water conveyance if they support aquatic life, riparian vegetation, or stream-dependent terrestrial wildlife. Riparian is defined as, "on, or pertaining to, the banks of a stream." Therefore, riparian vegetation is defined

as, “vegetation which occurs in and/or adjacent to a stream and is dependent on, and occurs because of, the stream itself.” Removal of riparian vegetation also requires a Section 1602 Lake and Streambed Alteration Agreement from the CDFW. Areas to the outer drip line of riparian vegetation are typically within CDFW jurisdiction under section 1602.

Clean Water Act and the Porter-Cologne Water Quality Control Act

The SWRCB regulates construction storm water discharges through SWRCB Order No. 2003-0017-DWQ, “General Waste Discharge Requirements for Dredge and Fill Discharges that Have Received State Water Quality Certification.” The state’s authority to regulate activities in wetlands and waters resides primarily with the SWRCB, which in turn has authorized the state’s nine RWQCBs, discussed below, to regulate such activities. Under Section 401 of the federal CWA, every applicant for a federal permit for any activity that may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards.

In the Project area, the North Coast RWQCB (NCRWQCB) regulates construction in waters of the U.S. and waters of the State, including activities in wetlands, under both the CWA and the State of California’s Porter-Cologne Water Quality Control Act (California Water Code, Division 7). Under the CWA, the RWQCB has regulatory authority over actions in waters of the U.S., through the issuance of water quality certifications, as required by Section 401 of the CWA, which are issued in conjunction with permits issued by the USACE under Section 404 of the CWA. The RWQCB must certify that a USACE permit action meets state water quality objectives (§401 CWA, and Title 23 CCR 3830, et seq.) before a USACE permit is issued. Activities in areas that are outside of the jurisdiction of the USACE (e.g., isolated wetlands, vernal pools, or stream banks above the ordinary high water mark) are regulated by the nine RWQCBs, under the authority of the Porter-Cologne Act, and may require the issuance of either individual or general waste discharge requirements.

The California Wetlands Conservation Policy (Executive Order W-59-93) establishes a primary objective to “ensure no overall net loss … of wetlands acreage and values in California.” The RWQCBs implement this policy and the Basin Plan Wetland Fill Policy, both of which require mitigation for wetland impacts.

State Species of Special Concern

The CDFW maintains a list of species and habitats of special concern. These are broadly defined as species that are of concern to the CDFW because of population declines and restricted distributions, and/or they are associated with habitats that are declining in California. The criteria used to define special-status species are described by the CDFW. Impacts to special-status plants, animals, and habitats may be considered significant under CEQA.

State Species of Special Concern include those plants and wildlife species that have not been formally listed, yet are proposed or may qualify as endangered or threatened, or are candidates for such listing under the California Endangered Species Act (CESA). This affords protection to both listed species and species proposed for listing. In addition, CDFW Species of Special Concern, which are species that face extirpation in California if current population and habitat trends continue, United States Fish and Wildlife Service (USFWS) Birds of Conservation Concern, and CDFW special-status invertebrates are considered special-status species by CDFW. Plant species included within the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (Inventory) with California Rare Plant Rank (CRPR) of 1 and 2 are also considered special-status plant species. Few Rank 3 or Rank 4 plants meet the definitions of Section 1901 Chapter 10

of the Native Plant Protection Act (see below) or Sections 2062 and 2067 of the CDFG Code that outlines the CESA. There are occasions where CRPR List 3 or 4 species might be considered of special-concern particularly for the type locality of a plant, for populations at the periphery of a species range, or in areas where the taxon is especially uncommon or has sustained heavy losses, or from populations exhibiting unusual morphology.

Also under the jurisdiction of CDFW and considered sensitive are vegetation alliances with a State ("S") ranking of S1 through S3 in the List of Vegetation Alliances (CDFG 2009). CDFG ranks sensitive communities as "threatened" or "very threatened" and keeps records of their occurrences in its California Natural Diversity Database.

Native Plant Protection Act

The CDFW administers the California Native Plant Protection Act (CNPPA) (Sections 1900–1913 of the CFGC). These sections allow the California Fish and Game Commission to designate rare and endangered plant species and to notify landowners of the presence of such species. Section 1907 of the CFGC allows the Commission to regulate the "taking, possession, propagation, transportation, exportation, importation, or sale of any endangered or rare native plants." Section 1908 further directs that "[n]o person shall import into this state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the Commission determines to be an endangered native plant or rare native plant."

California Coastal Act of 1976

The California Coastal Act (California Public Resources Code sections 30000 et seq) was enacted by the State Legislature in 1976 to provide long-term protection of California's 1,100-mile coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the California Coastal Commission (Commission) in its coastal development permit decisions and for the review of local coastal programs (LCPs) prepared by local governments and submitted to the Commission for approval. These policies are also used by the Commission to review federal activities that affect the coastal zone. Among other things, the policies require:

- Protection and expansion of public access to the shoreline;
- Protection, enhancement and restoration of environmentally sensitive habitats;
- Protection of productive agricultural lands, commercial fisheries and archaeological
- resources; and
- Protection of the scenic beauty of coastal landscapes and seascapes;

All new development proposed on tide and submerged lands, and other public trust lands must receive a permit from the Coastal Commission (PRC 30519(b), and 30416(d)). Section 30107.5 defines an "environmentally sensitive area" as "…any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments." An important Coastal Act policy is the protection, enhancement and restoration of environmentally sensitive habitats, including intertidal and nearshore waters, wetlands, bays and estuaries, riparian habitat, certain wood and grasslands, streams, lakes, and habitat for rare or endangered plants or animals. Article 4 Section 30231 of the Coastal Act provides that "(t)he biological productivity and the quality of coastal water, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human

health shall be maintained and where feasible restored….” Section 30233 discusses allowable uses of fill in coastal wetlands.

Regional and Local

Humboldt County General Plan Goals and Policies

Following are the Humboldt County General Plan goals and policies applicable to biological resources for the proposed Project.

> *3430 Goal*
>
> *To maximize where feasible, the long-term public and economic benefits from the biological resources within the County by maintaining and restoring fish and wildlife habitats.*
>
> *3431 Policies*
>
> *1. Maintain values of significantly important habitat areas by assuring compatible adjacent land uses, where feasible.*
>
> *2. Habitats for "critical species" shall be protected under provisions of NEPA and CEQA.*
>
> *3. Development within stream channels shall be permitted when there is no less environmentally damaging feasible alternative, where the best feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to essential, nondisruptive projects as listed in Standard 6.*
>
> *4. To protect sensitive fish and wildlife habitats and to minimize erosion, runoff and interference with surface water flows, the County shall maintain Streamside Management Areas (SMA), along its blue line streams as identified on the largest scale U.S.G.S. topographic maps most recently published, and any significant drainage courses identified through the CEQA process.*
>
> *5. Development within the Streamside Management Areas shall be permitted where mitigation measures (Standard 8) have been provided to minimize any adverse environmental effects, and shall be limited to uses as described in Standard 7.*
>
> *7. The County should request the Department of Fish and Game, as well as other appropriate agencies and organizations to review plans for development within sensitive habitat areas or Streamside Management Areas. Recommended mitigation measures shall be considered prior to project approval.*

Eel River Area Plan

The Eel River Area Plan includes regulations (goals and policies) regarding environmentally sensitive habitat areas such as wetlands, salt marshes, mudflats, coastal streams, and riparian habitats that are applicable to the proposed Project. County regulations limit the circumstances under which disruption of sensitive habitat, diking, filling, dredging of wetlands, and significant alteration of streams is permitted. These activities are permitted by the county when they are carried out for fish and wildlife habitat restoration or improvement with CDFW consultation (Eel River Area Plan Sections 30233(a), 30607.1, 30236). Development within riparian corridors is normally prohibited, but it can be permitted in order to maintain or replace flood control channels, construction of wells, road and bridge replacement, and construction of fences (Eel River Area Plan Section 30236). In perennial and intermittent streams in the EREP, the riparian corridor can extend as far as 200 feet from the inner (streamside) edge of riparian vegetation, depending on slope,

existing riparian vegetation, and the presence of areas of bank instability and slides (Eel River Area Plan Section 30236).

3.4.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to biological resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- 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;
- 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 U.S. Fish and Wildlife Service;
- 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;
- 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; or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Areas of No Project Impact

As explained below, the Project would not result in impacts related to two of the significance criteria identified in Appendix G of the current California Environmental Quality Act (CEQA) Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, as there are no applicable ordinances; or,
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. The Project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan as there are no such special plans that would govern the Project.

3.4.4 Methodology

Potential impacts to biological resources are evaluated for both construction and operational activities. The Project and operations are evaluated to determine compliance with applicable federal, State, and local permitting and design requirements. Potential impacts related to sensitive plants or animals are evaluated. Potential wetland impacts are evaluated by determining placement of fill material or temporary ground disturbance relative to mapped wetland boundaries. The evaluation also considers potential impacts to or changes in habitat type or extent, especially for sensitive habitats.

3.4.5 Impacts and Mitigation Measures

Impact BIO-1: Substantial Adverse Effect on Special-Status Wildlife Species

The applicant has avoided or minimized the amount of impacts to listed and sensitive species through adjustment of the Project footprint. This minimization and avoidance effort has been conducted during the Project planning phase and Project layout/design. Still, construction and operation of the proposed Project could directly or indirectly impact populations of Tidewater Gobies, raptors, migratory birds, Western Snowy Plover, Northern Red-legged Frog, salmonids, and their habitats.

The Project will require activities that could directly or indirectly affect Tidewater Gobies. Impacts on Tidewater Gobies could occur during various construction activities, including the retrofit of the tide gates, the installation of new tide gates, improvements to Centerville Slough, the reconnection of Russ Creek to Centerville Slough, the reconnection of Shaw Creek to Centerville Slough, and the improvement of existing and establishment of new off-channel habitat in the Project area. Operational activities could also directly or indirectly affect Tidewater Gobies. For example, improper handling of gobies or relocation of gobies to unsuitable habitat during preconstruction and pre-maintenance (operation) efforts to preserve individual Tidewater Gobies could result in injury or mortality. During construction dewatering of the Project area, gobies could become stranded or entrained into pumps. Gobies also could be crushed by equipment or debris, or they could be removed from their habitat during construction. Injury could result indirectly from habitat destruction, increased turbidity and sediment in channel waters related to construction activities, and exposure to contaminants (e.g., spills). Improvements to the Project area will benefit other aquatic species, including non-native species, such as Sacramento Pike Minnow, which can prey on Tidewater Gobies. The installation and operation of improved and new tide gates may alter hydrologic functions. This change may alter hydrologic conditions (e.g., salinity, flow, velocity) and create an environment intolerable for some life stages of Tidewater Goby, resulting in goby mortality. In the longer term, the Project would result in a net gain in suitable Tidewater Goby habitat and in the area of available higher quality habitat by restoring Centerville Slough including side channels and backwaters, and by greatly increasing the area subject to occasional tidal influence. Recent experience on the nearby Riverside Ranch/Salt River restoration documented a rapid increase in Tidewater Goby numbers and use of newly available habitat in the first year after restoration. Tidewater goby numbers are expected to increase within the Project area after restoration. However the short term impacts would be significant.

Federally threatened or endangered salmonid species that occur in close proximity to the Project area either as residents or non-residents are Coho salmon, steelhead, and Chinook salmon. Coastal cutthroat trout (SSC) also occur in the southernmost extent of their range as an apparently isolated riverine population in Russ Creek above Centerville Road. State-listed longfin smelt such as those recently documented in newly restored Riverside Ranch, are also present nearby. Effects on salmonids could occur if in-stream Project activities are conducted in areas where juvenile sensitive listed fish species could be present or migrating.

Although salmonids and other estuarine or anadromous fishes are believed to be rare or absent in the non-tidal portions of the site where most work would occur, some individual animals almost certainly occur in tidal waters in immediate proximity to the tidegates and levees and could be affected by construction. For example, vibratory pile driving is thought to potentially affect behavior of salmonids at distances up to at least 20 to 30 feet (Carlson 1996). Another study documented potentially greater effects on bottom dwelling species than on mid-water column species such as

salmonids, with the exposure zone extending only about 25 feet at six feet above the bottom, but up to 250 feet at the bottom (Burgess and Abbott 2005). In the longer term, a net benefit is expected for salmonids because the Project would allow seasonal access into portions of the site not currently available. Even with this longer term enhancement of fish passage and expansion of available habitat, the impacts on salmonids and other anadromous species would be significant.

A key goal of the Project is to increase the area of tidal influence and improve passage for aquatic organisms, including crustaceans, salmonids and other fish characteristic of tidal portions of the estuary. Tidal exchange would be reintroduced to the Inner Marsh and the re-established Centerville Slough with a new tidegate structure constructed through the existing dike. This new tidegate structure would be equipped with a muted tidegate regulator (MTR). The MTR will restrict tidal exchange to the Inner Marsh such that tidally controlled water levels would not rise above 2.5 feet elevation (NAVD 88) during the winter months (~mid-November to mid-April) and 5.0 feet during the summer months (~mid-April to mid-November). This restriction of winter tidal inflow would retain the Inner Marsh and re-established Centerville Slough capacity to provide freshwater storage from Russ Creek runoff similar to how it currently functions. Based on these seasonal operational levels, the gates would be open and capable of allowing passage for aquatic organisms when the outboard water level is at or below the above elevations. The outboard water levels are subject to Eel River flows and tides, and are constantly fluctuating. Winter (~mid-November through mid-April) access through the tidegates would be available approximately 24 percent (winter adult upstream) and 16 percent (winter juvenile upstream). Summer (mid-April through mid-November) access through the tide gates would be available 97 percent (summer adult upstream) and 76 percent (summer juvenile upstream) of the time. The Project provides a significant improvement to fish passage over existing conditions, which provides no passage at any time. If found compatible with the Project goals and objectives during final design, passage periods may be extended with auxiliary openings on the proposed tidegates.

The biological evaluation of the Project site determined that special-status, summer resident, avian species could be present at the site and impacted during construction due to vegetation removal or ground disturbance. This could affect both tree nesting and ground nesting species. There is also the potential for migratory bird species to fly over or stop at the site. Although habitat for many tree or cliff nesting species is not ideal, seasonal or occasional presence and/or nesting cannot be ruled out at this point in time. Project construction occurring during the March 1st through August 31st breeding season may have an adverse impact on breeding success for special-status bird species. Impacts to special-status bird species, raptors, and birds protected under the Migratory Bird Act would be a significant impact.

The Western Snowy Plover occurs in a band along the foredune west of the Project site, with specific known occurrences and identification of Primary Constituent Elements in multiple locations from Centerville Beach north to the mouth of the Eel River. According to agency discussions, the largest concentrations of birds are in the southern portion of the Project area near the Angel's Camp dune over-wash. Critical habitat was designated in 1999 and revised in 2012 (77 FR 36727-36869) and includes the entire dune complex from Centerville to the Eel River mouth. Proposed dune enhancement has the potential to directly and indirectly affect this species through long-term changes in habitat along the backdune fringe (southern blowout) and in the two northern dune reconstruction areas as well as through temporary visual and noise disturbance during construction on both EREP and RR&T. These would be significant impacts.

For known occurrences of Northern Red-legged Frog on the Project site, the majority of the primary habitat (i.e. the duckponds) will remain freshwater and thus direct loss of breeding habitat is not

expected. It is possible that some individual frogs could disperse outside of breeding season into areas of ground disturbance, thus there could be significant impacts to Northern Red-legged Frogs.

There would be changes in agricultural grassland areas at the site that provide potential foraging habitat for bats as a result of the Project. However, this impact is considered less than significant because agricultural grassland for foraging is regionally abundant and not a limiting factor for this species, and because special status bats have only a moderate probability of occurrence in the Project area (See Table 3.4-5). Townsend's big-eared bats and other bats can also utilize riparian areas and wetlands as foraging habitat, further reducing the impact on these species. The Project does not propose changes to buildings, bridges, rocky areas, or trees which could provide roost sites and no potential impact on roosting habitat is anticipated. Impacts to bats would be less than significant.

Mitigation Measure BIO-1a: Avoidance, Minimization, and Mitigation for Tidewater Goby.

Because implementing the Project could directly or indirectly harm or kill Tidewater Gobies, the following avoidance and minimization measures will be incorporated into the Project:

- Construction activities will be phased and conducted in a sequence that minimizes impacts to Tidewater Gobies. Construction also will be limited to dry-season work windows (June 15 through October 15) to reduce the amount of goby habitat affected and minimize the impact on water quality. Although dry-season work windows may coincide with spawning and larval development, the footprint of available goby habitat may be smaller because summer conditions typically are drier, reducing the area in which Tidewater Gobies may be present. In addition, conducting work during the dry season will minimize the impact on water quality from sediment generated by construction activities and from spills that could occur during construction and maintenance of the Project (e.g., oil, fuel, hydraulic fluid).
- Phase Project construction so Tidewater Gobies can be relocated to sites in the Project area but away from areas targeted for restoration. During excavation, Tidewater Gobies may be crushed by equipment or debris or may be removed from channels or marshes unintentionally by equipment. Mortality can be minimized by capturing and relocating Tidewater Gobies out of construction areas. Relocating Tidewater Gobies from areas targeted for restoration to habitat outside of the immediate restoration area before construction begins is intended to protect individual fish; however, improper capture and handling may result in injury or mortality. In addition, Tidewater Gobies that need to be relocated should be taken to areas that have suitable habitat (e.g., where Tidewater Gobies are known to thrive). Therefore, the capture and handling of Tidewater Gobies will be conducted by qualified biologists, and suitable habitats for relocation will be identified before construction begins. Tidewater gobies were successfully translocated as part of restoration activities at the nearby Riverside Ranch (Kramer 2016).
- Where dewatering needs to occur, all pump intakes will be screened, and only qualified biologists will conduct goby rescue during dewatering. Dewatering to facilitate excavation and other construction activities may be harmful if Tidewater Gobies become entrained into dewatering pumps or if Tidewater Gobies become stranded.
- To compensate for the increased potential for predation by non-native species on Tidewater Gobies, the quantity and quality of post-construction habitat for Tidewater Gobies will be increased in the Project area. Tidewater Goby populations are expected to expand into restored areas and be able to withstand any potential increase in predation by non-native species such as Sacramento Pikeminnow as a result of this increase in complex vegetated aquatic habitat.

Mitigation Measure BIO-1b: Conduct pre-construction Avian Surveys for Nesting Passerine Birds and Avian Species of Special Concern.

Trees are not present; therefore, none would be removed. Clearing of shrubs or other vegetation, if necessary for construction or maintenance, shall be conducted during the fall and/or winter months from August 16 to February 29, outside of the active nesting season for migratory bird species (i.e., March 1 to August 15). If vegetation removal or ground disturbance cannot be confined to work during the non-breeding season, the applicant shall have a qualified biologist conduct preconstruction surveys within the impact area for ground disturbance, vegetation removal and/or maintenance activities, to check for nesting activity of migratory, raptors, and special-status bird species. The biologist shall conduct the preconstruction surveys within the 14-day period prior to vegetation removal and ground-disturbing activities (on a minimum of three separate days within that 14-day period). If ground disturbance and vegetation removal work lapses for 15 days or longer during the breeding season, a qualified biologist shall conduct a supplemental avian preconstruction survey before Project work may be reinitiated.

If active nests are detected within the construction or maintenance (operation) footprint or within 500 feet of construction activities, the applicant shall have locations flagged that are supporting breeding, and will not begin ground disturbing work or vegetation removal inside the buffers until the nests have fledged. Construction activities shall avoid nest sites until the biologist determines that the young have fledged or nesting activity has ceased. If nests are documented outside of the construction (disturbance) footprint, but within 500 feet of the construction area, buffers will be implemented if deemed appropriate in coordination with CDFW. In general, the buffer for common species would be a minimum of three feet, the buffer for sensitive species would be 300 feet, and the buffer for raptors would be 500 feet.

Mitigation Measure BIO-1c: Avoid, Minimize, and Mitigate for Potential Impacts to Western Snowy Plover.

Construction and maintenance activities associated with dune re-establishment would be conducted between September 1 and March 1, outside of the plover nesting season. The area of impact, defined as permanent or semi-permanent change in elevation or conversion to > 30 percent vegetation cover, would be mitigated through enhancement of dunes elsewhere on the EREP site, in the northern half of the dune complex within the site (generally between the northern limit of the Inner marsh and the outlet of the Eel River). Enhancement would occur at a minimum ratio of 1.1:1, and would include removal of European beach grass through mechanical or other appropriate methods; and quarterly maintenance, through removal of re-sprouts, for a period of two years post-construction. The initial removal effort would occur concurrently with the impacts. This would result in no net loss nor temporal loss of suitable Western Snowy Plover breeding habitat.

Mitigation Measure BIO-1d: Habitat Enhancement for Northern Red-legged Frog.

Although direct impacts to Northern Red-legged Frog breeding habitat is not anticipated because the duckponds will remain in freshwater conditions, measures for this species are included because individual frogs may disperse for considerable distances and could enter construction areas. Pre-construction surveys would occur prior to ground disturbance in any areas of potential frog habitat (not in saline or tidal areas).

After consultation with CDFW, a qualified Project biologist will relocate Northern Red-legged Frog eggs if observed within the direct Project footprint in spring prior to construction or if observed during Project implementation.

Mitigation Measure BIO-1e: Mitigate for potential impacts to salmonid species

The in-water construction and maintenance work window will be limited to June 15th through October 15th to avoid or minimize impacts to juvenile salmonids. Before potential de-watering activities begin in creeks or channels within the Project area, the qualified Biologist shall ensure that native aquatic vertebrates and larger invertebrates, if feasible, are relocated out of the construction footprint into a flowing channel segment by a qualified fisheries biologist. In deeper or larger areas, water levels shall first be lowered to manageable levels using methods to ensure no impacts to fisheries and other special status aquatic species. A qualified fisheries biologist or aquatic ecologist shall then perform appropriate seining or other trapping procedures to a point at which the biologist is assured that almost all individuals within the construction area have been caught. These individuals shall be kept in buckets with aerators to ensure survival. They shall then be relocated to an appropriate flowing channel segment or other appropriate habitat as identified by the qualified Biologist in consultation with NOAA Fisheries and CDFW. Federally threatened salmonid species that occur within the Project area either natal or non-natal Coho salmon, steelhead, and Chinook salmon.

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-1a addresses potential impacts to the Tidewater Goby and mitigates potential impacts to less than significant levels within applicable rules and regulations, and has a standard scientific approach for addressing potential impacts to this species.

Implementation of Mitigation Measure BIO-1b provides protection measures during construction for special-status birds and would mitigate potential impacts on special-status and migratory birds to less-than-significant levels by requiring pre-construction surveys by a qualified biologist to determine whether special-status or migratory bird nests are present at or near the Project site and ensure the protection of nests and young until they have fledged.

Mitigation Measure BIO-1c identifies avoidance and compensation measures for Western Snowy Plover including seasonal work windows and enhancement of dune habitat elsewhere on the EREP site to offset direct impacts to habitat. This would reduce impacts to a less than significant level.

Mitigation Measure BIO-1d requires pre-construction surveys for Northern Red-legged Frog, and relocation of any individual animals found within ground disturbance areas. This would reduce impacts to a less than significant level.

Mitigation Measure BIO-1e identifies seasonal avoidance measures for salmonids and other sensitive fish species, and relocation of individual salmonids if any are located within dewatering areas. The Project will also result in a long-term benefit to salmonids due to establishing seasonal access to extensive areas which are currently not accessible. This would reduce impacts to a less than significant level.

There are no anticipated impacts to bat species and mitigation is not proposed.

Impact BIO-2: Substantial Adverse Effect on Special-Status Plant Species

The applicant has avoided or minimized the amount of impacts to listed and sensitive species through adjustment of the Project footprint. This minimization and avoidance effort has been conducted during the Project planning phase and Project layout/design.

The Project footprint would avoid direct impacts to populations of sensitive listed plant species mapped on the site except for Lyngbye's sedge in areas adjacent to installation of the new tidegate. The proposed Project could directly or indirectly impact populations of one federally listed

and several CRPR listed plant species through changes in tidal prism and site hydrology, through operation activities, post-construction (operational) changes in sand movement associated with foredunes, and/or if new plant populations are identified beyond the previously mapped extent or if new species are identified at the site.

Mitigation Measure BIO-2a: Mitigate Impacts to Beach Layia

The following measures shall be implemented to mitigate impacts to the federally listed beach layia during construction and operation/ongoing maintenance of the Project, primarily associated with dune building on EREP and European beachgrass removal associated with Western Snowy Plover habitat enhancement required by Mitigation Measure BIO-1c.

A pre-construction survey shall be conducted prior to the beginning of ground disturbing work and at the appropriate season to verify the extent of known beach layia occurrences and to identify new occurrences on or adjacent to dunes, if any. At the beginning of construction, flagging or exclusion fencing shall be installed around all known occurrences of beach layia within 10 feet of construction limits. Locations of fencing shall be identified and flagged by a qualified biologist and installed while the biologist is present. The fencing shall be inspected weekly for the duration of construction to ensure that the fencing remains installed properly. Direct impacts to beach layia shall be avoided.

If any new or existing occurrences of beach layia are in proximity to areas of Project-related ground disturbance and if Project activities could conceivably result in indirect impacts such as alteration of dune erosion or deposition patterns, then mitigation will be employed that includes one or more of the following mechanisms: protective wooden fencing to shelter the population from shifting sand, seed collection from the site and/or nearby known occurrences so that replacement plants can be grown out at a nursery and replaced at a stable portion of the site (2:1 planting ratio), seed collection for seed banking in the event indirect impacts occur as a result of the Project in a dynamic coastal environment, plant relocation, and/or preparation of a sensitive species management plan (SSMP) that provides further details about the above options in cooperation with USFWS as to which mechanism(s) are preferred option(s) at the time of impact. The triggering mechanism for seed banking would be if this plant species is identified within 100 feet in a downwind direction of dune establishment, and/or 50 feet in any other direction, or within the footprint of the proposed Western Snowy Plover mitigation area. If an SSMP is deemed appropriate by jurisdictional agencies, the report would lay out specific timing and details of seed collection, mitigation site identification (within EREP), substrate preparation, monitoring and maintenance. If plant replacement, or relocation is deemed necessary (whether through relocation and/or replanting) annual monitoring for two years shall be required, with no net loss of number of individual number of plants. If replanting is employed, a 2:1 planting ratio includes built in overplanting in order to meet success criteria and no net loss.

Mitigation Measure BIO-2b: Mitigate Impacts to Sensitive-Listed Plant Species

Mitigation for special status plant species other than beach layia is addressed collectively for all species, with modifications noted for individual species; this measure is patterned after and slightly modified from one used successfully on the adjacent Salt River (Grassetti et al. 2011). Significant impacts to special-status plant species present or likely to be present onsite shall be minimized, avoided, and (if necessary) compensated by complying with the following:

- Pre-construction and maintenance surveys: Potential habitat for special-status plant species shall be surveyed in appropriate seasons for optimal species-specific detection prior to Project excavation/dredging, fill, drainage, or flooding activities associated with Project construction and maintenance. Survey methods shall comply with CNPS/CDFG rare plant

survey protocols, and shall be performed by qualified field botanists. Surveys shall be modified to include detection of juvenile (pre-flowering) colonies of perennial species when necessary. Any populations of special-status plant species that are detected shall be mapped. Populations shall be flagged if avoidance is feasible and population is located adjacent to construction areas. Previous special-status plant surveys documented populations of Lyngbye's sedge and Humboldt Bay owl's clover as described above.

- The locations of any special status plant populations to be avoided shall be clearly identified in the contract documents (plans and specifications).
- If special-status plant populations are detected where construction or maintenance would have unavoidable impacts, a compensatory mitigation plan shall be prepared and implemented in coordination with CDFW. Such plans may include salvage, propagation, on-site reintroduction in restored habitats, and monitoring. Plans have been developed for Lyngbye's sedge, Humboldt Bay owl's clover, and eelgrass, and will be further revised in consultation with regulatory agencies.

Impacts to these species shall be avoided or minimized to the extent feasible. It should be noted that populations of owl's clover can fluctuate dramatically between years (Pickart 2001), making the number of individuals impacted difficult to predict in advance.

- Humboldt Bay owl's clover: A qualified botanist shall collect and conserve seed from local (preferable on-site, or from the immediate region if on-site sources are insufficient) populations of Humboldt Bay owl's clover. These seeds shall be used to replant a population of this species to mitigate for the population lost to construction impacts. The Project area shall be monitored for five years and compared with a reference population to determine whether replanting and natural recruitment have resulted in population numbers equal to or greater than those present before Project implementation. If the population does not appear to have reestablished during the five-year period, seed shall be collected from elsewhere and additional attempts shall be made to reestablish the population.
- Lyngbye's sedge: Seed shall be collected from Lyngbye's sedge in the Project area to be used for replanting in the event that natural recruitment does not result in a post-Project population size equal to or greater than the pre-Project population size. Monitoring and adaptive management will be conducted for a ten year period to determine whether the area and approximate number of Lyngbye's sedge in the Project area is similar to the area of sedge before the Project. Additional planting efforts (from seed or from rootstock of mature plants) shall be undertaken if the population size is declining below pre-Project size during the monitoring period.
- Eelgrass: The extent and density of eelgrass cover within areas of Project impact shall be mapped prior to construction. Natural recruitment shall be monitored for three years to determine whether eelgrass is naturally recruiting in newly created channels adequately to replace the area of eelgrass lost due to Project impacts. If eelgrass does not establish in an area equal to or greater than that lost due to Project impacts in the first three years, eelgrass shall be actively planted to offset any lack of natural recruitment, using the most current scientific methods and following NMFS guidance.

If CDFW requires propagation or transplantation, scientifically sound genetic management guidelines and protocols for rare plants shall be applied.

Level of Significance: Less than significant impact with mitigation.

Mitigation Measure BIO-2a and BIO-2b would mitigate the impact through a combination of avoidance, minimization, and replacement or relocation if necessary of individual plants and is for Beach Layia and sensitive plants consistent with regulations governing sensitive species.

Impact BIO-3: Substantial Adverse Effect on Sensitive Natural Community.

Four sensitive (S3 ranking) natural vegetation communities were identified within the Project area (0.12 acres of intact Dune Mat, 4.2 acres of Saltmarsh bulrush, 12.2 acres of Coastal dune willow thickets, and 37.5 acres of Pickleweed mats. Of these, temporary impacts to the 41.7 acres of combined Saltmarsh habitats (saltmarsh bulrush and pickleweed) would be considered a significant impact. Per the Project description, it is expected that tidal saltmarsh species that colonize the Inner Marsh and re-establish in Centerville Slough during the summer growing season will tolerate reduced tidal amplitude during the winter. It is anticipated that post-construction Saltmarsh and Brackish Herbaceous marsh habitats will increase by a net of 126.3 acres (Table 3.4-6, Figure 3.4-5) and lead to an increase in the quality and function of wetland habitats. Because there may be a short-term transitional period while saltmarsh species colonize newly available areas, the construction and operational impact would be significant.

A net increase in Dune Mat habitat is expected (Table 3.4-6 Figure 3.4-5) and will provide the opportunity for significant expansion (39.6 acres) of this sensitive habitat type. However there would be potential temporary impacts to small isolated areas of dune mat during construction. This would be a significant impact.

There would be little change in the extent of coastal dune willow thickets, and only minor potential temporary impacts during construction. This impact would be less than significant.

Ground disturbance and creation of new open areas could result in the colonization or expansion of existing populations of noxious weeds such as Himalayan blackberry (*Rubus armeniacus*), purple loosestrife (*Lythrum salicaria*), and bulboos canarygrass (*Phalaris aquitica*), and the colonization of new tidal marsh areas by dense flowered cordgrass, which could indirectly or directly affect sensitive natural communities including wetlands and dune ecosystems at the site. Once a tidal connection is re-established to the Inner Marsh, it is anticipated that creeping bentgrass (an invasive non-native plant prolific within the agricultural wetlands at the site) will die back and that a mix of salt and brackish marsh species will naturally colonize channel banks and the higher flats. Ongoing weed management activities over the maintenance period of the Project are anticipated to ensure that invasive plants are maintained at minimal levels. Construction activities could import noxious weed propagules on construction machinery. This would be a significant impact.

Eel grass is considered a sensitive habitat as it is Essential Fish Habitat. This plant community is present in Cutoff Slough, yet no changes are proposed there and no direct or indirect impacts are anticipated, however, restoration of estuarine conditions inside of tidegates are likely to promote expansion of eelgrass beds into the Project area. Hydrodynamic modeling and adversion/dispersion modeling of salinity suggest no significant adverse impact relative to existing conditions. Re-established Centerville Slough and the re-connected tidal channels within the Inner Marsh are anticipated to provide suitable habitat for natural recruitment of Eel grass.

Table 3.4-6 Change in Habitat Areas

Change in Habitat Area (Acres)	TWC			Russ			Overall Project		
	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change
Agricultural	691.5	563.6	-127.9	351.9	353.1	1.2	1043.3	916.7	-126.6
Pasture and/or Agricultural Wetland	608.6	495.1	-113.5	342.3	343.8	1.5	950.8	838.9	-111.9
Freshwater Emergent Herbaceous	82.9	64.3	-18.6	9.6	9.3	-0.3	92.5	73.6	-18.9
Forested Agricultural Grassland	0	4.2	4.2	0	0	0	0	4.2	4.2
Non-Agricultural	544.7	672.4	127.7	161.9	160.7	-1.2	706.5	834	127.5
Ammophila	117	100.4	-16.6	11.1	3.1	-8	128.1	103.5	-24.6
Aquatic	44.3	61	16.7	12.4	11.3	-1.1	56.7	72.2	15.5
Bare Ground	0.8	0.6	-0.2	1.6	1.5	-0.1	2.4	2.2	-0.2
Beach	56.4	58.2	1.8	50.5	50.5	0	106.9	108.7	1.8
Developments	1.4	1.4	0	1.2	1.2	0	2.6	2.6	0
Dominant Invasive	14.5	0.1	-14.4	0	0	0	14.5	0.1	-14.4
Dune Mat	44.3	59.2	14.9	0.4	7.6	7.2	44.6	66.9	22.3
Forested Riparian	11.3	10.4	-0.9	0.9	0.9	0	12.2	12.2	0
Levee/Berm	20.1	20.8	0.7	4.4	4.6	0.2	24.5	25.3	0.8
Road	7.3	7.3	0	3	3	0	10.3	10.3	0
Tidal Wetland (Saltmarsh/ Brackish Herbaceous/ Mudflat)	207.3	333	125.7	76.4	77	0.6	283.7	410	126.3
Scrub Shrub	20	20	0	0	0	0	20	20	0
Unmapped	1.6	1.6	0	87.4	87.4	0	89	89	0
Approximate Total	1237.6	1237.6	0	601.1	601.1	0	1838.7	1838.7	0

Mitigation Measure BIO-3a: Mitigate Impacts to Sensitive Listed Habitats Through Avoidance and Re-establishment.

The restored tidal wetlands will be monitored to determine whether it is developing the diversity representative of native tidal marshes. If necessary, planting and/or seeding or other remedial measures may occur to augment natural recruitment and/or to increase the diversity of salt marsh species using an adaptive management approach.

The small patches of intact Dune Mat vegetation will be protected in a similar manner as proposed to protect sensitive plant species above so that impacts during construction can be avoided. If any new or existing occurrences of Dune Mat vegetation communities are in proximity to areas of Project-related ground disturbance, and if Project activities could conceivably result in indirect impacts such as alteration of dune erosion or deposition patterns, then mitigation will be employed that includes one or more of the following mechanisms: protective wooden fencing to shelter the sensitive vegetation community from shifting sand, seed collection from the site and/or nearby known occurrences so that replacement plants can be grown out at a nursery and replaced at a stable portion of the site (2:1 planting ratio), seed collection for seed banking in the event indirect impacts occur as a result of the Project in a dynamic coastal environment.

Mitigation Measure BIO-3b: Mitigate Impacts to Sensitive Listed Habitats Through Control of Invasive Species.

In order to reduce the likelihood of dense-flowered cordgrass (Spartina) colonizing restored tidal marsh, existing populations in and adjacent to (north of the tidegates) the Project footprint shall be controlled prior to construction using manual, mechanical, and/or approved chemical methods, and in compliance with appropriate methods analyzed and disclosed in the Regional Invasive Spartina Management Plan and the associated EIR. During the operation period of the Project (10 year maintenance under the adaptive management plan), removal of cordgrass would be conducted under the authority of the Regional Invasive Spartina Management Plan and the associated EIR. Colonization of the Inner Marsh and other portions of the Project footprint by cordgrass will be controlled in collaboration with the region-wide eradication program.

Invasive weed removal shall be conducted as part of Project maintenance. Weed removal techniques may include manual, mechanical, and/or approved chemical means (including mowing, cutting, pulling, grinding, and/or excavation and burial) as discussed in the adaptive management plan and as approved by jurisdictional agencies.

Heavy equipment would be required to be cleaned and weed-free before entering the site.

Level of Significance: Less than significant with mitigation.

Project activities are anticipated to result in a net increase in tidal wetlands as the Project has been designed to enhance and increase tidal wetlands as invasive non-native species die back due to tidal influences and saltmarsh vegetation naturally recruits along slough channels and within the enhanced inner marsh. Changes in tidal wetlands will be monitored and governed through implementation of the adaptive management plan. A smaller net increase is expected for dune mat communities.

Mitigation Measure BIO-3a provides for avoidance of sensitive areas and supplemental seeding if determined to be necessary by monitoring. Mitigation Measure BIO-3b will oversee invasive plant removal and control during implementation and during the maintenance period to enhance natural community quality. These measures reduce impacts to less than significant levels.

Impact BIO-4: Substantial Adverse Effect on Federally and/or State Protected Wetlands.

The Project design includes both filling of two and three parameter wetlands, as well as re-establishment of new wetlands. The preliminary design analysis shows that it is anticipated that the Project will result in no net loss of wetlands with no permanent impact to wetlands. The final design and required agency permit applications will show documentation of no net loss in wetlands and breakdown of wetland impact and establishment. Overall, the Project will result in a conversion and increase in tidal wetlands and a reduction in agricultural/grazed wetlands. The change in wetland type is not deemed a significant impact since habitat value will be enhanced in the Inner Marsh through improved tidal prism and associated habitat quality.

Although no net loss overall to wetland acreage/quantity or quality is expected, the proposed Project could result in short-term temporary impacts to permanent, seasonal, and transitional wetland areas. Construction activities associated with restoration implementation would involve disturbance of wetlands and waters through vegetation clearing activities, grading and installation of restoration features, dewatering activities, and construction and use of access roads and staging areas for construction equipment, materials and stockpiles. Vegetation clearing activities may occur in advance of other restoration actions, resulting in a temporary loss of wetlands with increased duration of site disturbance. Short-term impacts to wetlands and waters are considered significant.

Mitigation Measure BIO-4: Mitigate Temporary and Short-term Impacts to Sensitive Habitats Including Wetlands Through Construction Minimization and Avoidance Measures.

- The locations of sensitive habitats including wetlands to be avoided shall be clearly identified in the contract documents (plans and specifications).
- Before clearing and grubbing commences, disturbance areas shall be flagged to clearly define the limits of the work area. These areas shall be clearly identified on the contract documents (plans and specifications).
- Selected contractors shall sign a document stating that they have read, understand, and agree to the required resource avoidance measures, and shall have construction/maintenance crews participate in a training session on sensitive resources.
- A qualified biologist shall be on-site to observe activities as appropriate when construction or maintenance in or adjacent to sensitive habitat including wetlands occurs. Site disturbance shall be minimized to the greatest extent feasible by using existing disturbed areas for access roads and staging areas, and concentrating the area of disturbance associated with restoration actions within the minimum space(s) necessary to complete the Project. Where feasible, temporary measures for access or construction, such as the use of temporary tracks or pads, shall be used to minimize impacts. Revegetation activities shall take place at seasonally appropriate times based on habitat types, and as soon as feasible following habitat disturbance, to restore disturbed areas to pre-Project conditions or better.
- There would be no net loss of jurisdictional wetlands. Any permanent fill in wetlands would be compensated through in-kind re-establishment or enhancement of wetlands at a ratio determined by use of the USACE SPD Mitigation Ratio Checklist and the California Coastal Commission.

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-4 will avoid permanent impacts and minimize temporary impacts to wetlands, and reduces impacts to a less than significant level.

Impact BIO-5: Interfere Substantially with Movement of Native Resident or Wildlife Species or With Established Native Resident or Migratory Wildlife Corridors, or Impede Use of Native Wildlife Nursery.

One of the primary goals of the Project is to enhance tidal prism, which is expected to increase the area accessible to salmonids and other aquatic species. Thus there would be a net gain in the area of accessible aquatic habitat and potential for movement of salmonids and other aquatic species.

There would be some temporary interference with movement of both terrestrial and aquatic species during construction while silt fences are in place and during instream work. Because of the large size of the Project area, there would be alternative corridors for movement, and the duration of any interference would be of relatively short duration. In addition, the post-Project condition would be similar to or better than pre-Project conditions. In general, the effect on avian species and larger or highly mobile mammal species would be minimal. With regard to protection under the Migratory Bird Treaty Act, refer to the analysis under Impact BIO-1. Temporary interference to movement of fishes and other aquatic species would occur in areas where seasonal or other periodic barriers are already present, and the Project would in many cases result in long-term removal or reduction of these barriers.

Mitigation Measures: No mitigation is proposed.

Level of Significance: Less than significant

Impact BIO-6: Conflict with Local Policies or Ordinances Protecting Biological Resources.

The Project does not conflict with approved local, regional, or state habitat conservation plans, as there are no such special plans that would govern the Project other than compliance with Humboldt County General Plan goals and policies in relation to minimization of impacts to biological resources, as discussed under Impact BIO-1 and BIO-2 above. Impact BIO-3 and Mitigation Measure BIO-3 address minimization of impacts to sensitive habitats where feasible per the guidance of County General Plan goals and policies. The Project does not conflict with local policies for the protection of biological resources.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.4.6 Cumulative Impacts

Many of the projects identified in Table 3-1 could result in impacts to sensitive biological resources, such as special status species, wetlands, and riparian habitat. However, these impacts would be mitigated through surveys and avoidance measures, and BMPs. Implementation of the remainder of the Salt River Ecosystem Restoration Project would enhance the habitat value of the Eel River Estuary Preserve and the Russ Properties by creating a larger contiguous area of open space and habitats managed for plants and wildlife. This larger area would support larger populations of plants and animals, and such populations would be more resilient to future disturbances.

Construction at both Eel River Estuary Preserve and Salt River could result in short-term impacts to sensitive biological resources, such as special status species. However, these impacts would be mitigated through avoidance measures and BMPs and in some cases, specific mitigation measures. Implementation of the complete Salt River project would provide access to additional upstream habitat, with connectivity from freshwater to brackish habitat as well as provide an

adjacent riparian corridor. Cumulative biological impacts are less than significant with the proposed mitigation.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

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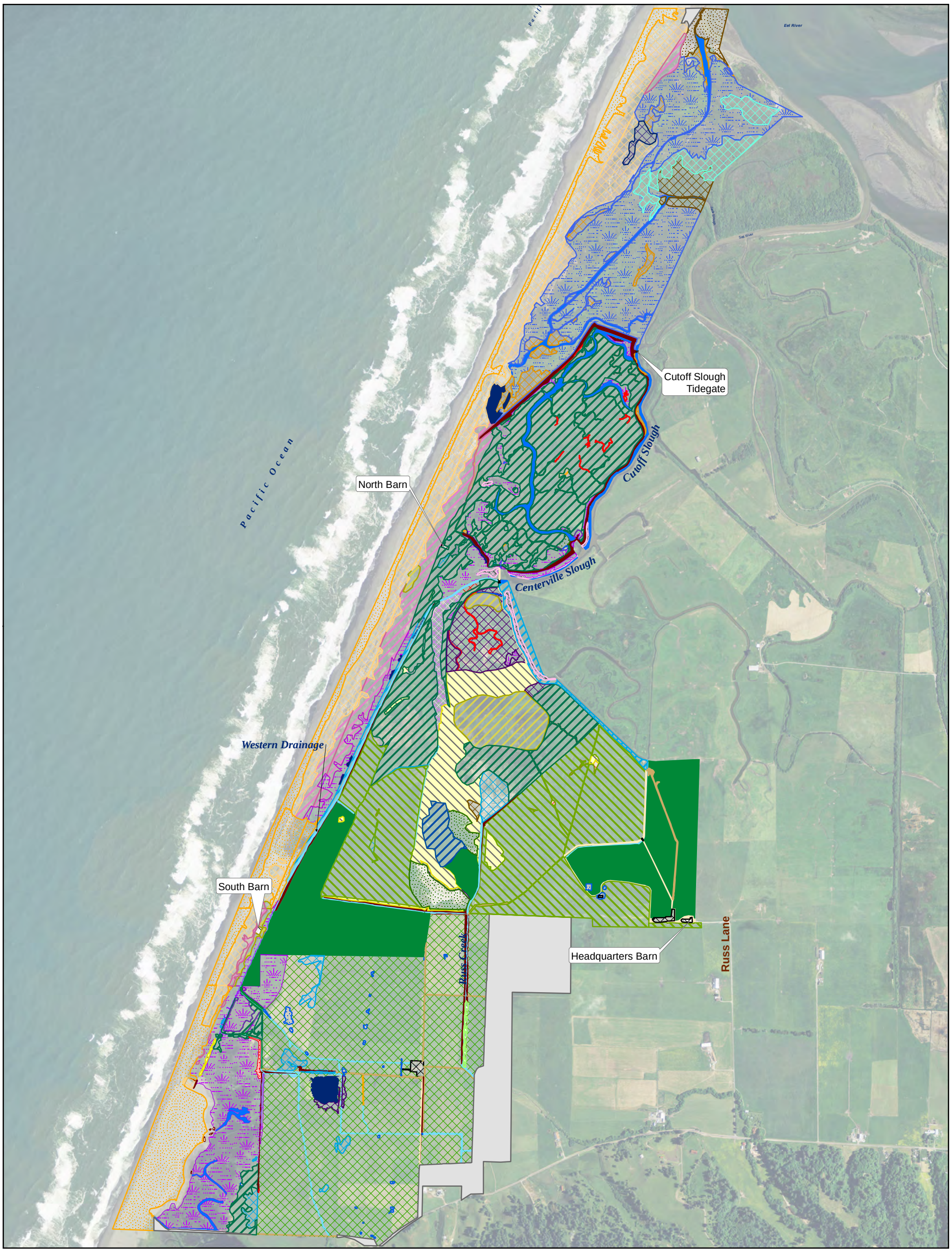

Vegetation Alliance

- Abronia latifolia - Ambrosia chamissonis
- Agrostis stolonifera
- Agrostis stolonifera - Potentilla anserina
- Agrostis stolonifera - Distichlis spicata
- Alnus rubra - Salix hookeriana
- Ammophila arenaria
- Atriplex prostrata-Cotula coronopifolia
- Baccharis pilularis
- Bolboschoenus maritimus
- Deschampsia caespitosa
- Distichlis spicata
- Eleocharis macrostachya
- Festuca perennis
- Holcus lanatus
- Juncus breweri
- Juncus effusus
- Juncus lescurii
- Potentilla anserina ssp. pacific
- Rumex crispus
- Salix hookeriana
- Schoenoplectus pungens
- Spartina densiflora Complex

Other Habitat

- Bare Ground
- Beach
- Development
- Ditch
- Improved Road
- Managed Pasture
- Mudflat
- Open Water
- Other Invasive
- Sarcocornia pacifica
- Sarcocornia pacifica Complex
- Slough
- Unimproved Road
- Unmapped
- Upland Ruderal

Paper Size 11" x 17" (ANSI B)

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Map Projection: Lambert Conformal Conic
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Eel River Estuary and Centerville Slough Enhancement Project

Job Number	8410882
Revision	A
Date	17 May 2016

Biological Resources
Existing Vegetation Mapping Figure 3.4-1

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Data source: Habitat Mapping, GHD, 2013, J.B. Lovelace & Associates, 2011, and Humboldt Bay Harbor District Preliminary Spartina Mapping, 2013; Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:JClark2

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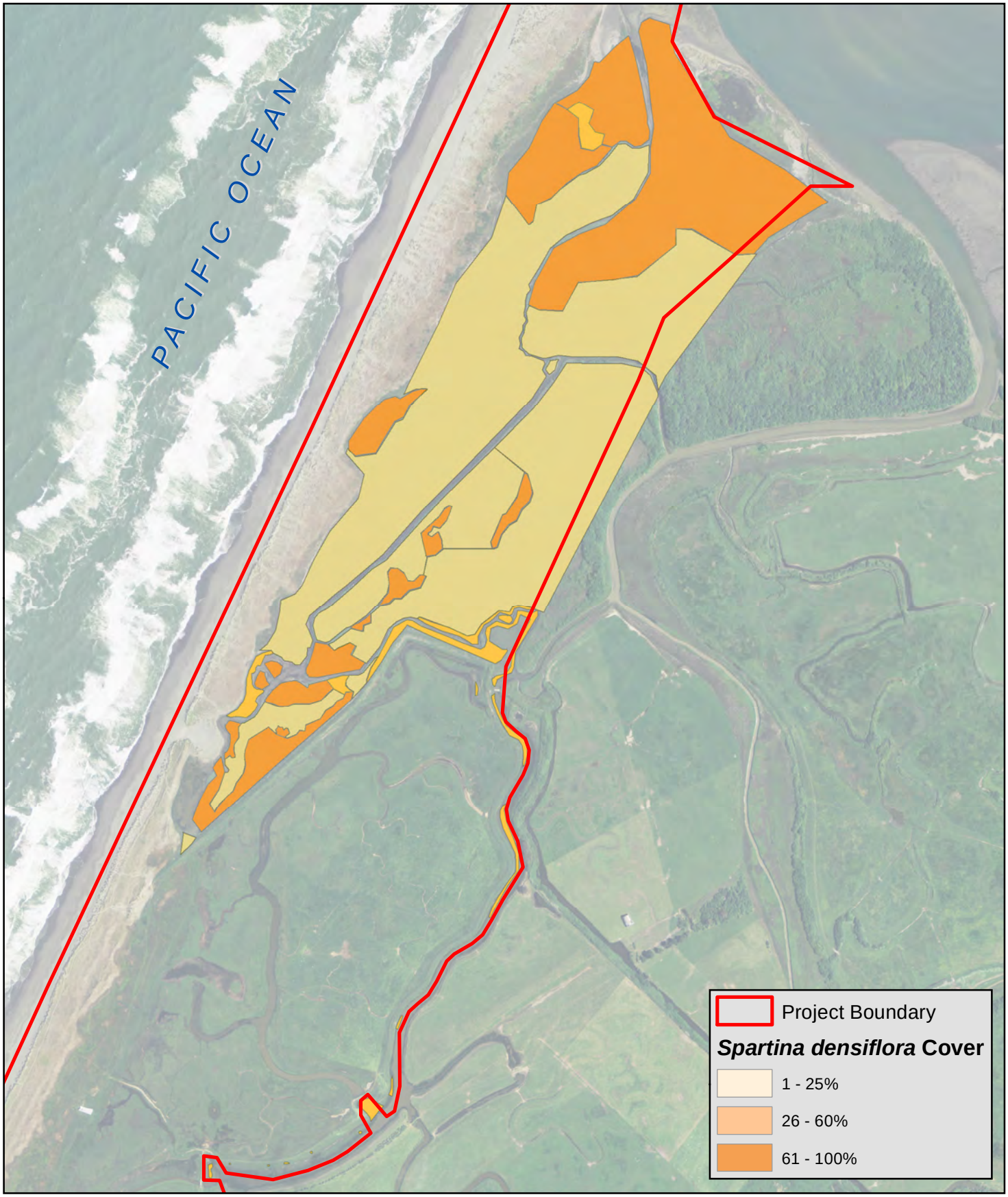

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Eel River Estuary and Centerville Slough Enhancement Project

Biological Resources
Spartina densiflora Cover

Job Number	8410882.03
Revision	A
Date	17 May 2016

Figure 3.4-2

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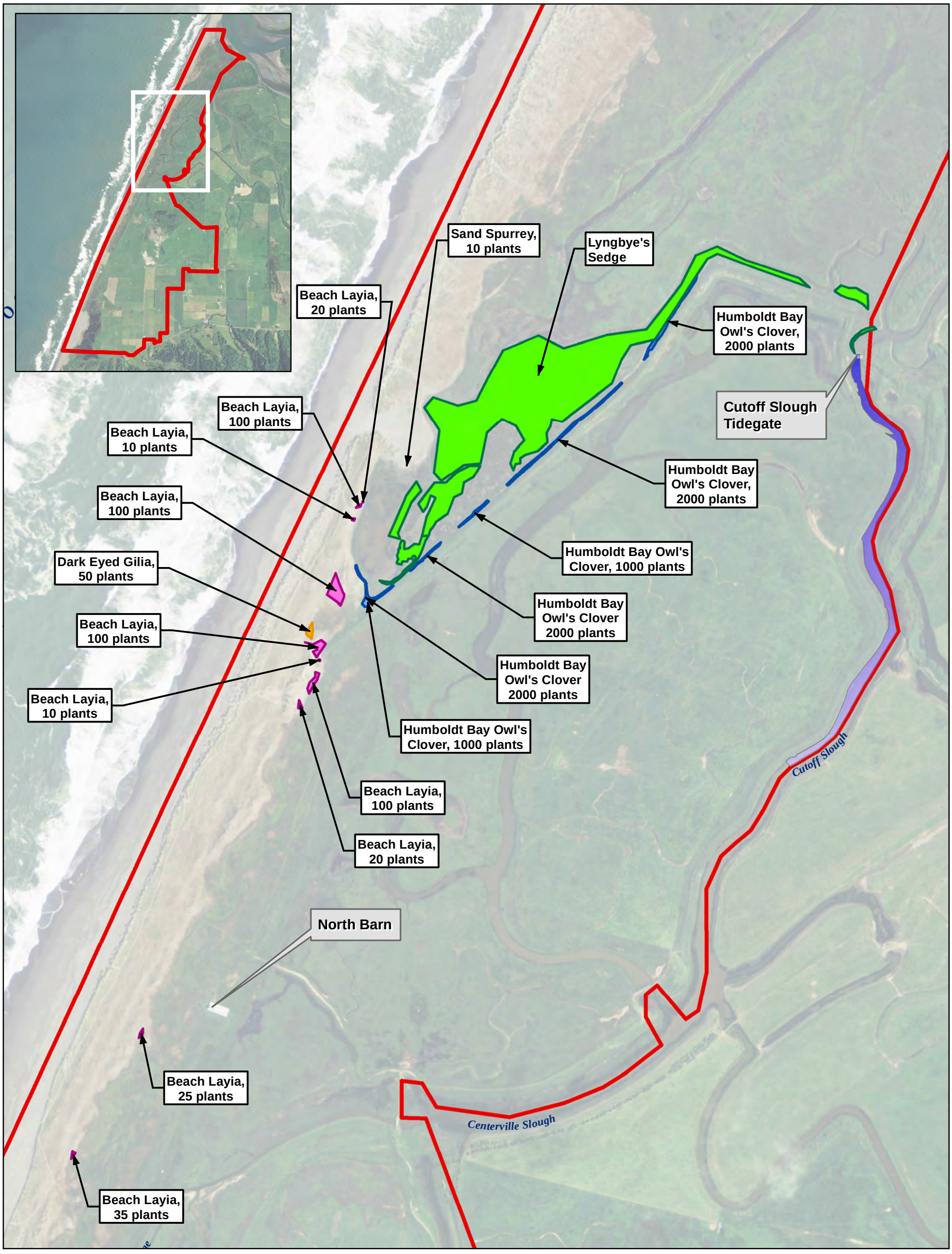

Eel Grass Percent Cover *Dark = 15%, Light = 0 - 5% cover*

Humboldt Bay's Owl-Clover (CRPR List 1B.2)

Beach Layia (FE, SE, CRPR List 1B.1)

Dark Eyed Gilia (CRPR List 1B.2)

Lyngbye's sedge (CRPR List 2B.2)

Project Boundary

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Map Projection: Lambert Conformal Conic
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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 05 Jul 2016

Biological Resources
Special Status Plant Survey Results

Figure 3.4-3

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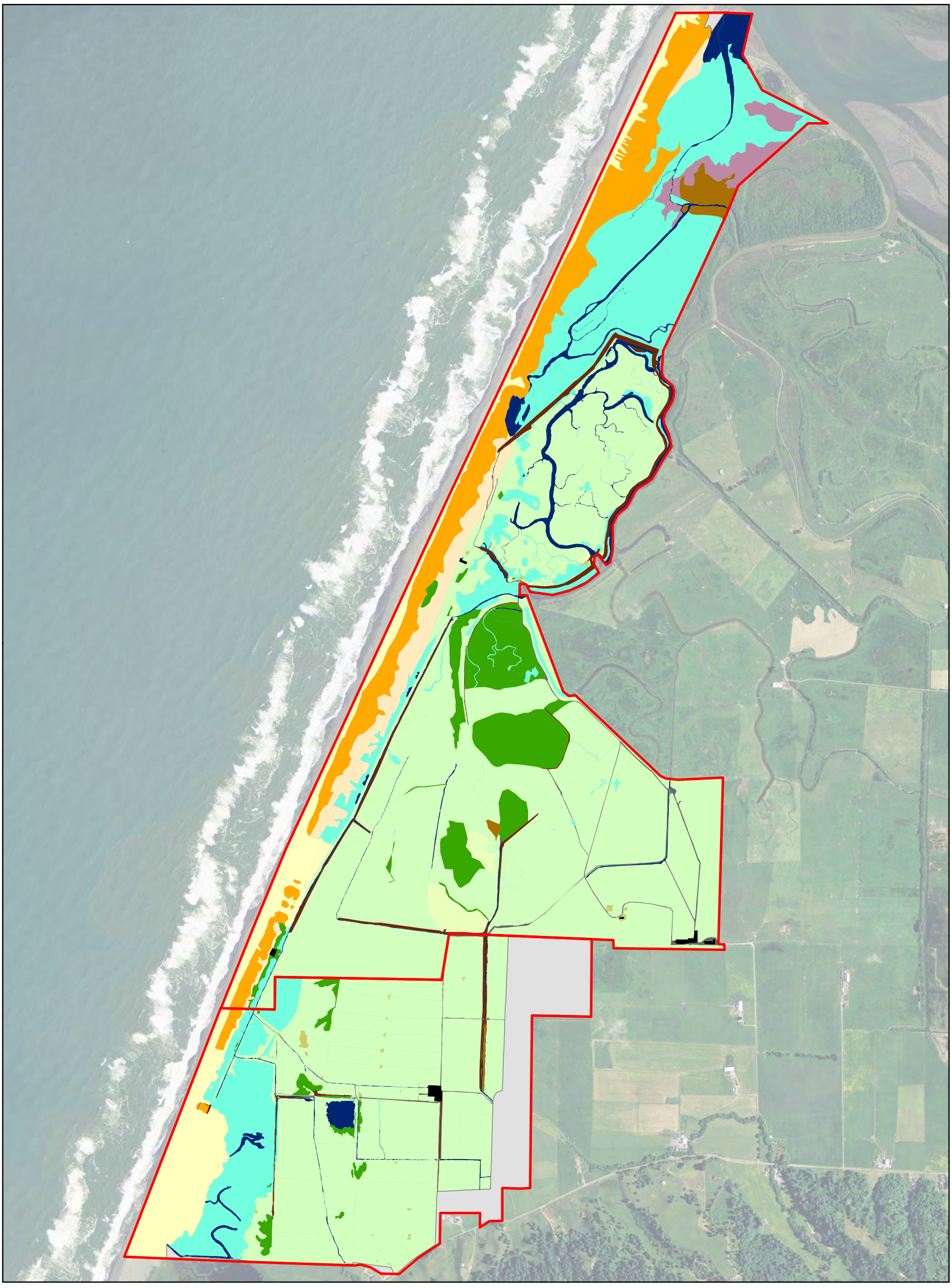

Project Boundary

Agricultural
- Freshwater Emergent Herbaceous
- Pasture and/or Agricultural Wetland

Non-Agricultural
- Ammophila
- Aquatic
- Bare Ground
- Beach
- Developments
- Dominant Invasive
- Dune Mat
- Forested Riparian
- Levee/Berm
- Roads
- Tidal Wetland (Saltmarsh/Brackish Herbaceous/Mudflat)
- Scrub Shrub
- Unmapped

Paper Size 11" x 17" (ANSI B)

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Map Projection: Lambert Conformal Conic
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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision C
Date 30 Aug 2016

Biological Resources Existing Habitat Summary

Figure 3.4-4

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Data source: Wetland Mapping, GHD, 2013, and Mad River Biologists, 2011; Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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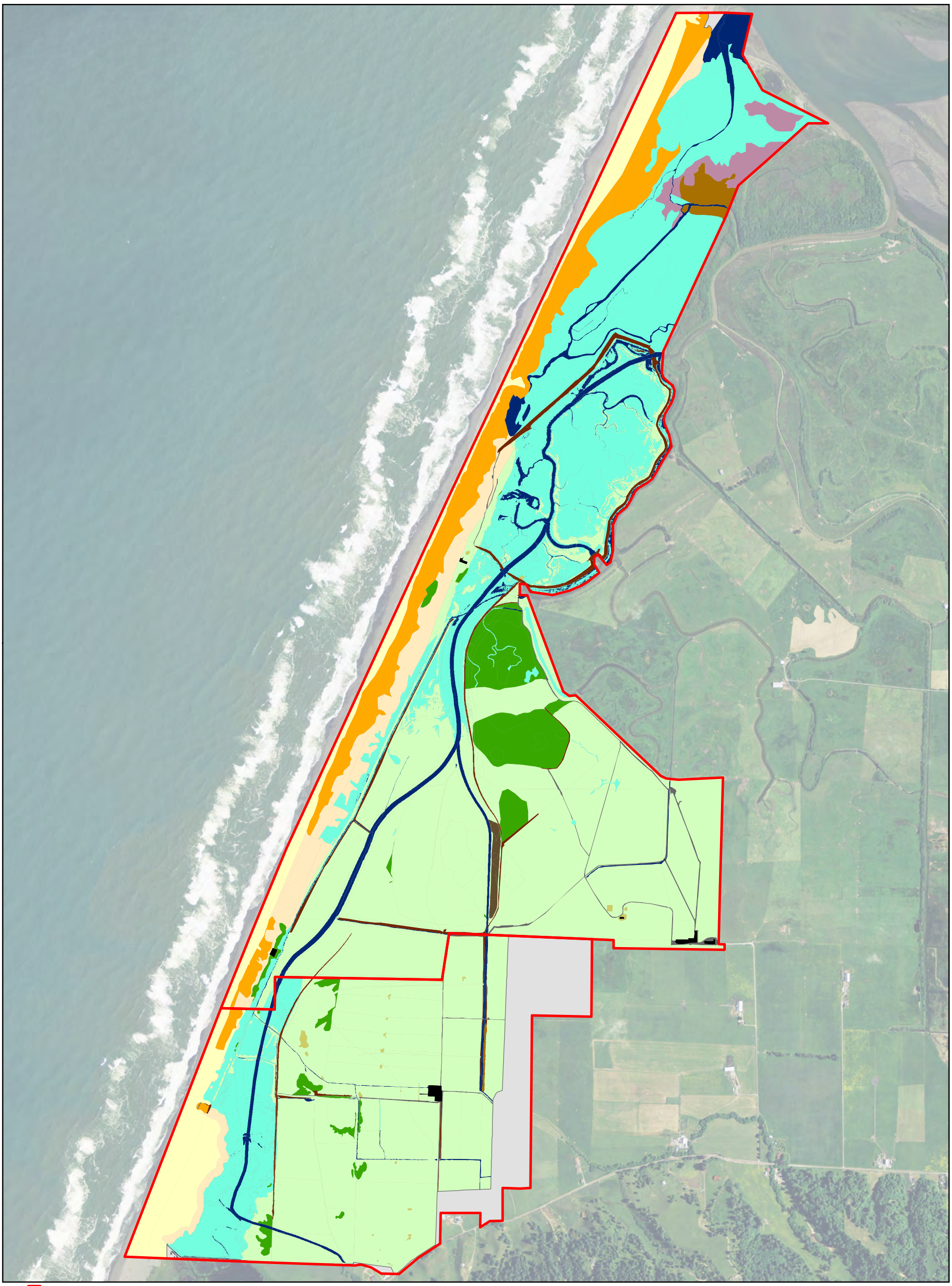

Project Boundary

Agricultural
- Freshwater Emergent Herbaceous
- Pasture and/or Agricultural Wetland
- Forested Agricultural Wetland

Non-Agricultural
- Ammophila
- Aquatic
- Bare Ground
- Beach
- Developments
- Dominant Invasive
- Dune Mat
- Forested Riparian
- Levee/Berm
- Roads
- Tidal Wetland (Saltmarsh/Brackish Herbaceous/Mudflat)
- Scrub Shrub
- Unmapped

Paper Size 11" x 17" (ANSI B)

0 1,000 2,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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GHD

Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision C
Date 30 Aug 2016

Biological Resources Proposed Habitat Summary

Figure 3.4-5

G:\Legacy\Projects\1000298 CalTrout\8410882 EREP EcosystemEnhancement\08-GIS\Maps\Figures\BiologyReport2016\F3.4-5_Proposed_Habitat_Summary.mxd

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Data source: Wetland Mapping, GHD, 2013, and Mad River Biologists, 2011; Parcel Lines, Humboldt County, v41, 2010; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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3.5 Cultural Resources

This section evaluates the potential impacts related to cultural resources during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the archaeological and historical setting for the Project area, and the Regulatory Framework section describes the applicable federal, state and local regulations affecting the Project area. Descriptions in this section are based on reviews of published information, reports, and plans regarding cultural resources. The evaluation criteria and impacts and mitigation measures sections establish the thresholds of significance, evaluate potential cultural resource impacts, and identify the significance of impacts and feasible mitigation measures if necessary.

A cultural resources investigation was prepared for this Project by Roscoe and Associates in June, 2016. The results of the study are described below (Roscoe and Associates 2016). Due to the sensitive nature and location of archaeological sites, this report is not included as an appendix to this EIR; however, it is available to review at the Lead Agency's office.

3.5.1 Setting

Prehistoric Context

The Project area is located within the ethnographic territory of the Wiyot Indians who had an original population of 1,000 to 3,300 prior to European settlement. According to Humboldt State University linguist Victor Golla, the Wiyots arrived in the Humboldt Bay area approximately 2,000 years ago, inhabiting a lagoon environment that afforded the use of coastal resources. The Yuroks then came "at a much later date," sometime subsequent to the arrival of the first Athabascan speakers, who came after 600 CE (Common Era).

The Wiyot lived almost exclusively in villages along the protected shores of Humboldt Bay and near the mouths of the Eel and Mad Rivers. Villages consisted of dwellings that were rectangular in shape and made from split redwood planks. The Wiyot utilized a wide range of plant and animal resources gathered within their territory, including mollusks, sea lions, stranded whales, deer, elk, and acorns. The most important food source was anadromous fish from coastal streams such as the Mad and Eel Rivers and smaller tributaries.

After the start of the California Gold Rush, from 1850 to 1860, Wiyot territory became the center for the largest concentrations of European settlers in California north of San Francisco. The settlers utilized Humboldt Bay as a major shipping point for supplies to the gold mines on the Trinity, Klamath, and Upper Sacramento Rivers. In addition, the establishment of the redwood timber industry, and homesteading of the Eel River and Arcata Bottom for ranching and farming purposes, brought more people into the area. Settlers killed almost all of the Wiyot people in a coordinated series of massacres in February 1860.

Historic Context

Recognizing that Euro-American settlement was the event that changed forever the natural systems in the Delta, several early developments on lower Eel River provide a historic context for understanding present conditions. These 19th century activities were economic pursuits, instituted to further livelihoods and wealth in the settlement community, although in the case of the commercial fisheries, both the resource and much of the wealth were exported. Reclamation projects converted marshes to agricultural land for cultivated crops, dairying, and ranching. The commercial fisheries on lower Eel River was a text-book case of the "tragedy of the commons," and even acknowledged as such by a commercial fisherman of the day. Navigation on Salt River was

an important economic development on the lower river and its early demise was attributed to human activities, notably reclamation and the associated reduction of tidal prism (Van Kirk 2008, 2013).

Records and Literature Search

The background research for this Project included archival research at the Humboldt State University Library, Humboldt County Library, Humboldt County Historical Society, Humboldt County Assessors and Recorders Office, and the Department of Public Works. The California Historical Resources Information System (CHRIS) records search included an examination of the archaeological site records, maps, and Project files at the Northwest Information Center (NWIC), one of the regional information centers of the CHRIS. The NWIC is located at Sonoma State University, Rohnert Park, California. Roscoe and Associates conducted the record search on September 9, 2013. An updated record search was completed on February 2, 2016.

In addition to the library and NWIC record search, the following inventories were consulted: the Historic Property Directory, the National Register of Historic Places (NRHP), Determinations of Eligibility for the National Register of Historic Places, Historic Spots in California, California Historical Landmarks, and California Points of Historical Interest, California Register of Historical Places, and the California Inventory of Historic Resources. The literature search is undertaken to determine if there are any previously recorded archaeological resources or historic structures within the Project area and whether the area has been included in any previous archaeological research or reconnaissance projects.

The records search and literature review for this study were done to (1) determine whether known cultural resources had been recorded within or adjacent to the study area; (2) assess the likelihood of unrecorded cultural resources based on archaeological, ethnographic, and historical documents and literature, and on the environmental setting of nearby sites; and (3) develop a context for preliminary recommendation of identified resources.

Previous Research

The records search at the NWIC revealed that six cultural resource studies have been conducted within ½ mile of the Project area (Table 3.5-1). No previously recorded archaeological or cultural sites were documented within ½ mile of the Project area; however, three historic resources do occur within ½ mile of the Project area (Table 3.5-2).

For the Project parcels, deed searches were conducted in the Humboldt County Recorder's Office, Eureka, California in September and October, 2013. Tax assessment records, federal census schedules and newspaper microfilm, notably the Ferndale Enterprise, which were researched at the Humboldt County Library in Eureka and Humboldt State University Library in Arcata provided historical information on the properties. Parcel maps, U.S.G.S. Quad maps, the historic Belcher, Metsker, and Forbes maps; maps from the "Humboldt Bay Historical Atlas" (Laird), and surveys and maps in the Recorder's Office were used to locate property ownerships and the history of the properties structures.

Table 3.5-1 Previous Studies within 1/4 –Mile Record Search Radius of Project

Study No.	Date	Author	Title	Results
S9860	1988	Van Kirk	Fern Cottage National Register Nomination	One National Register eligible site
S24299	1998	Pieper, J	1-98-203, 22 acre Timber Harvest Plan	No sites
S43826	2008	Roscoe et al./2008	A Cultural Resources Investigation of the Salt River Ecosystem Restoration Project	P-12-002939; P-12-002941; P-12-002940-all within 1/2 mile
No S #	2011	Roscoe J. and W. Rich	Addendum Report for Additional Phase I Cultural Resources Investigation of the Proposed Salt River Ecosystem Restoration Project	No sites
S39842	2012	Miller, R	An Archaeological Survey Report for the Pries Timber Harvesting Plan, Humboldt County, CA	No sites
S39898	2012	McCann, R	EQIP-Project #12FY12-0051	Noted Fern Cottage and various historic barns and Outbuildings

Table 3.5-2 Previously Recorded Cultural Resources within Project Area and ½ Mile Study Area

P Number/ Trinomial	Site Type	Author/Date	Distance from Project Area
P-12-002939	Riverside Ranch Dike and Drainage System	Rich, W. and E. Whiteman 2008	Located 1/2 mile from Project area.
P-12-002941	Channel Improvement Features	Rich, W. and E. Whiteman 2008	Located 1/4 mile from Project area.
P-12-002940	Barn and Corral	Rich, W. and E. Whiteman 2008	Located 1/4 mile from Project area.

Native American Consultation and Tribal Cultural Resources

Consultation initiated by Roscoe and Associates included a letter faxed to the Native American Heritage Commission (NAHC) on September 23, 2013. The NAHC was asked to search their Sacred Lands Inventory File and to provide a list of Native American representatives for the Project area. The NAHC replied on October 2, 2013 that no sacred lands were present within the Project area and provided a list of interested Native American tribes near the Project area. A letter was sent to all representatives on the NAHC list on September 26, 2013, and again on January 12, 2016. Thomas Torma PhD, Tribal Historic Preservation Officer (THPO) for the Wiyot Tribe, responded on October 8, 2013, "…the Tribes cultural information on this area, beyond information contained in site Loud AQ, is currently missing –this is especially distressing as the tribe owns property on Cock Robin Island. I wish you best of luck on the survey and look forward to seeing it. We also look forward to being future neighbors with the preserve." Erika Collins M.A., THPO for the Bear River Band of the Rohnerville Rancheria, replied on October 8, 2013 "A review of Bear River's cultural resource database did not identify any previously recorded cultural resources within the

Project area. We have record of one previously recorded site, Loud AQ, approximately ¾ mile outside of the Project area's northwest edge. Please let me know when you plan to schedule the fieldwork; if possible either Eli or I would like to join you for some of the survey." Ms. Collins participated in the field survey on February 12, 2014. Janet Eidsness M.A., THPO, Blue Lake Rancheria, responded on October 8, 2013, "Note the Project is located outside Blue Lake Rancheria's mapped area of concern for tribal resources. No need to consult with me further about this Project." No further responses were received as a result of the 2016 mailing.

Subsequently, and consistent with recent guidance from the California Natural Resources Agency, Samuel Schuchat, Executive Officer of the Coastal Conservancy, contacted Stephen Kullman, Natural Resources Director for the Wiyot Tribe to seek Wiyot guidance on development of the DEIR, and to inquire if the Wiyot would like to initiate government to government consultation. By letter sent August 2, 2016, Mr. Schuchat provided the NOP, outlined the Project, and provided contact information for future communications.

Following the issuance of the first Notice of Preparation for the Project in December 2014 the Project team began developing the framework for the CEQA analysis. However, prior to issuance of the second Notice of Preparation (November 2015) the State of California's Natural Resources Agency adopted new CEQA guidelines pursuant to AB 52. This new CEQA guidelines treat Tribal Cultural Resources separately and distinctly from Cultural Resources. In light of the prior discussions with tribal representatives, invitations to engage in government to government consultation, and requests for guidance from the Wiyot on development of the Project and the DEIR, the Project Team determined that revising the framework for the DEIR would be unnecessary, and detract from ongoing efforts to comply with the spirit of recently adopted guidelines for Tribal Cultural Resources.

Field Survey

An archaeological field reconnaissance of the EREP portion of the Project area was conducted by Roscoe and Associates, on October 1, 17, 18, 26 and 27, 2012, February 12, 2014, and the RR&T properties portion of the Project area on December 1 and 8, 2015. The archaeological field investigation involved a systematic, mixed-strategy archaeological field survey of the entire Project area. The survey was designed to suit the study area's sensitivity for the occurrence of prehistoric and historic cultural resources based on pre-field research.

The highest priority was given to potentially sensitive areas identified through pre-field research as having been the focus of historic land-use and settings where prehistoric archaeological sites might be located. Intensive field reconnaissance included systematically traversing the Project area at 25 meter intervals or less. At regular intervals, the surveyors scraped the ground surface, using a hoe or shovel, to allow inspection of the mineral soil. The aim of this survey method was to cover the entirety of the Project and to identify areas of high archaeological sensitivity not indicated through pre-field research.

Linear historic sites such as dikes and ditches were inspected along their lengths to identify associated features, and to assess integrity. Historic and topographic maps and aerial photographs were utilized as an aid in locating and mapping linear systems.

Expected prehistoric cultural resource indicators included chert and obsidian tools, lithic debitage, ground stone implements, milling stone features, locally darkened soil, shell and/or bone debris, and pit features. Expected historic cultural resource indicators included ceramic, glass, or metal artifacts, structures, and pits.

Inventory Results

During the field investigation, several structures and buildings associated with the RR&T properties were identified. These include five standing barns, one demolished barn, two demolished grain silos, a Quonset Hut, a corral complex and associated cattle scale, a ca. 1900's home, and a tidewater control system of dikes, ditches and gates. A brief description of each feature is outlined below.

Feature 1: The North Barn. This barn provided storage space for hay grown on the ranch and a covered/floored area for stock feeding in the northern area of the ranch. A set of corrals and a watering trough are also associated with the barn.

Feature 2: The South Barn. This barn provided storage space for hay grown on the ranch and a covered/floored area for stock feeding in the southern area of the ranch.

Feature 3: The Quonset Hut. This building housed the large metal rollers used for barley processing. By the late 1950's this building also housed the Centerville Duck Club's office.

Feature 4: Willow Barn Ruins and Grain Silos. Just to the north of the Quonset hut is evidence of a large barn, known as the Willow Barn. This was a dairy barn and later used as a feed barn with hay stored in the middle section with feeding on either side. Rolled barley was fed to cattle in four barns on the ranch, including the Willow Barn. The concrete base of one silo is 20 feet in diameter, 63 feet in circumference; the other silo exists only as rubble.

Feature 5: Fern Cottage Corrals and Cattle Scale. This complex of holding pens with metal gates, chutes, and 68-foot catwalk along one long chute, plus two buildings, is located near the preserve headquarters.

Feature 6: Potato Barn. The barn was once used for moving, sorting, inspecting, and packaging potatoes before shipment. Today, the potato barn has been repaired and the present building appears to be nearly all new construction.

Feature 7: Dike and Ditch System. This feature includes a coastal levy system and a tide flood gate, all constructed after the 1964 floods.

Feature 8: Former site of the Scotia Gun Club Cabin. This feature was the location of the former cabin/bunkhouse, which had been used by the Scotia Gun Club. Local resident, Bruce Slocum, who had visited the cabin as a boy, said that it was built of logs that had washed up on beach from a log raft. The cabin had a small brick fireplace, a kitchen area with a water pump in the sink, and several sets of bunkbeds for the duck hunters. Very little remains at the cabin site today. According to Slocum, the cabin burnt in the 1970's, and only a few fragments of brick, glass, and earthenware mark its former location.

Feature 9: Robart House and Horse Barn. Based on background research, the house may date back to the 1890s, and represents a house-type prevalent during the settlement period. Currently, the house is used for residential purposes and has been improved with double paned windows and metal roof. The horse barn is apparent in 1948 aerial photographs, suggesting it does not date to the Robarts tenure, but may have come as a later addition.

Feature 10: Shaw Barn. Background research showed that the barn was under construction in June of 1906 and was likely completed that year. At some point, the roof was covered in corrugated sheet metal, most likely within a decade or two of construction. The barn is historically associated with Joseph A. Shaw. Currently, the barn is used for agricultural purposes for RR&T.

These features were inventoried to identify potentially historically-significant properties that could be impacted by implementation of the Project. No physical impacts will be experienced by any of these properties with the exception of some isolated areas of the ditch and dike system.

3.5.2 Regulatory Framework

Federal

Section 106 of the National Historic Preservation Act

The proposed Project will require a permit from the U.S. Army Corps of Engineers (USACE). Section 106 of the NHPA requires that, before beginning an undertaking, a federal agency, or those they fund or permit, must take into account the effects of the undertaking on historic properties and afford the Advisory Council on Historic Preservation and other interested parties an opportunity to comment on these actions.

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a historic property, as defined in 36 CFR 800.5. An impact is considered significant when prehistoric or historic archaeological sites, structures, or objects listed in or eligible for listing in the NRHP are subjected to the following effects:

- physical destruction of or damage to all or part of the property
- alteration of a property
- removal of the property from its historic location
- change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance
- introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features
- neglect of a property that causes its deterioration
- transfer, lease, or sale of the property.

Cultural resources significance is evaluated in terms of eligibility for listing in the NRHP. NRHP significance criteria applied to evaluate the cultural resources for this Project are defined in 36.CFR 60.4 as follows: The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, association, and

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

Specific regulations regarding compliance with Section 106 state that, although the tasks necessary to comply with Section 106 may be delegated to others, the federal agency is ultimately responsible for ensuring that the Section 106 process is completed according to statue.

State

California Environmental Quality Act

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historic, architectural, archaeological, cultural, or scientific importance. Under CEQA statute an impact on a cultural resource is considered significant if a Project would result in an impact that may change the significance of the resource (Public Resources Code [PRC] Section 21084.1). Demolition, replacement, substantial alteration, and relocation of historic properties are actions that would change the significance of a historic resource (California Code of Regulations, Title 14, 15064.5). The following steps are normally taken in a cultural resources investigation to comply with CEQA:

- Identification of cultural resources
- Evaluate the significance of the cultural resources based on established thresholds of significance
- Evaluate the impacts of a Project on cultural resources
- Develop and implement measures to mitigate the impacts of the Project on significant cultural resources.

Because the Project is located on non-federal land in California, it is also necessary to comply with state laws pertaining to the inadvertent discovery of human remains of Native American origin. The procedures that must be followed if burials of Native American origin are discovered on non-federal land in California are described in the Impacts and Mitigation Measures section, below.

California Public Resources Code

As part of the determination made pursuant to PRC Section 21080.1, the lead agency must determine whether a Project would have a significant effect on archaeological and paleontological resources.

Several sections of the PRC protect cultural resources and PRC Section 5097.5 protects vertebrate paleontological sites located on public land. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site (including fossilized footprints), inscriptions made by humans, rock art, or any other archaeological, paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. Violation of this section is a misdemeanor.

PRC Section 5097.98 states that if Native American human remains are identified within a Project area, the landowner must work with the Native American Most Likely Descendant as identified by the NAHC to develop a plan for the treatment or disposition of the human remains and any items associated with Native American burials with appropriate dignity. These procedures are also addressed in Section 15046.5 of the CEQA Guidelines. Section 30244 of the PRC requires reasonable mitigation for impacts on paleontological and archaeological resources that occur as a result of development on public lands.

On September 25, 2014, Assembly Bill 52 (AB 52) was signed, which included amendments to PRC Section 5097.94. AB 52 requires tribal cultural resources to be considered under CEQA. AB 52 requires lead agencies to provide notice to Native American tribes that are traditionally and culturally affiliated with the geographic area of a proposed Project if they have requested notice of projects proposed within that area.

California Health and Safety Code

California Health and Safety Code Section 7050.5 prohibits disinterring, disturbing, or removing human remains from a location other than a dedicated cemetery. Section 7050.5 also requires that construction or excavation be stopped in the vicinity of discovered human remains until the Coroner can determine whether the remains are those of a Native American. If determined to be Native American, the Coroner must contact the California NAHC.

California Native American Historical, Cultural and Sacred Sites Act

This Act applies to both state and private lands. The Act requires that upon discovery of human remains, that construction or excavation activity cease and that the county Coroner be notified. If the remains are of a Native American, the Coroner must notify the NAHC. The NAHC then notifies those persons mostly likely to be descended from the Native American remains. The Act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

Regional and Local

Humboldt County

The following are the goals and policies from the *Humboldt County General Plan* and *Eel River Area Plan* that are most applicable to the Project with regard to cultural resources.

3530 Goal.

To provide for the protection and enhancement of cultural resources for the historic, scientific, educational, and social contributions they render to the present generation and to generations that follow.

3531 Policies

1. *Cultural resources (including but not limited to archaeological, paleontological and architectural sites, grave sites and cemeteries) shall be identified where feasible, assessed as to significance, and if found to be significant, protected from loss or destruction.*
2. *Concerned citizens, historical organizations and applicable agencies shall be consulted during project review for the identification and protection of cultural resources.*
3. *Projects located in areas found to have cultural resources shall be conditioned and designed to avoid loss or degradation of these resources.*
4. *Expert opinions and field reconnaissance at the applicant's expense may be required during environmental assessment to determine the presence, extent, and condition of cultural resources and the likely impact upon such resources.*
5. *Archaeological and paleontological resources shall not be knowingly destroyed or lost through a discretionary action unless:*
    - *A. The site or resource has been found to be of insignificant value by relevant experts and representatives of the cultural resources community, or;*
    - *B. There is an overriding public benefit from the project, and compensating mitigation to offset the loss is made part of the project.*
6. *Mitigation measures shall be required where new development would adversely impact archaeological or paleontological resources.*

Eel River Area Plan

30244. Where new development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Office, reasonable mitigation measures shall be required.

A. Reasonable mitigation measures may Include but are not limited to:

1. Changing building and construction sites and/or road locations to avoid sensitive areas.

2. Providing protective cover tor sites that cannot be avoided.

3. Where appropriate and with the approval of all parties concerned, provide for the removal or transfer of culturally significant material by a professional archaeologist or geologist.

3.5.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would be considered to have a significant impact on cultural resources if it would result in any of the following:

- Cause a substantial change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;
- Disturb any human remains, including those interred outside of formal cemeteries, or
- Cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074?

3.5.4 Methodology

The impact analysis included in this section is based on the cultural resources investigation conducted for the Project by Roscoe and Associates as described above, as well as Roscoe's subsequent outreach to the Tribes relative to recently adopted CEQA guidelines pursuant to AB 52 regarding Tribal Cultural Resources. The NAHC was also contacted for a review of the Sacred Lands Inventory File and to provide a list of Native American representatives for the Project area.

3.5.5 Impacts and Mitigation Measures

Impact CR-1: Would the Project cause a substantial change in the significance of a historical or archaeological resource as defined in Section 15064.5.

The field survey inventory results, as noted above in Section 3.5.1, recorded five standing barns, one demolished barn, two demolished grain silos, a Quonset Hut, a corral complex and associated cattle scale, a ca. 1900's home, and a tidewater control system of dikes, ditches and gates associated with the reclamation works within the Project site. Eligibility criteria as delineated by Section 106 and California Register of Historic Resources (CRHR) criteria were applied in the evaluation of the buildings and features. The criteria are similar, one more focused on California history and cultural heritage and the other more broadly applied (see Section 3.5.2, Federal). The

eligibility criteria for listing on the NRHP and the CRHR outline the regulations for properties that are associated with the broad patterns of history (criterion A) and/or important people (criterion B), are notable examples of the built environment (criterion C), and have or may have archaeological value (criterion D).

According to the cultural resources investigation, the five standing barns, one demolished barn, two demolished grain silos, a Quonset Hut, a corral complex and associated cattle scale, a ca. 1900's home, and a tidewater control system of dikes, ditches and gates are not considered historic resources eligible for listing on the CRHR nor historic properties eligible for listing on the NRHP. The sites may be associated with an important event or theme on the local level; however, they do not retain integrity of the context to be considered significant for listing on the CRHR or NRHP under Criterion A. The Barns and Quonset Hut were heavily damaged during the 1964 flood and almost completely rebuilt and modified. The Dike and Ditch System was also heavily damaged during the 1964 flood and was repaired and rebuilt. The existing floodgates were constructed in the mid 1970's. The Willow Barn and silos were destroyed by the 1964 flood and not rebuilt. All that remain are the concrete foundations and some debris. The sites are not significant under criterion B because they are not likely to be directly associated with an important person. These sites cannot be considered significant under Criterion C because they do not possess a particular quality such as the oldest type or best available example of its type. The sites are not eligible under criterion D because they do not possess data to address important research questions.

Based on previous research and the results of Roscoe and Associates' cultural resources investigation, no cultural resources, including archaeological or historical resources, were identified within or immediately adjacent to the Project site. However, it is possible that significant (as defined by CEQA) historical or unique archaeological resources that could not be observed during the course of the field survey may be buried on the Project site. Due to an extensive history of flooding and silt deposits in the area, it is possible, although unlikely, that buried archaeological materials are present at this site. Specific mitigation measures are included in Section 3.5.5 (Impacts and Mitigation Measures) in the event buried archaeological resources are uncovered during Project related excavations. The disturbance of these resources during site excavation activities would be a significant impact, therefore, the following mitigation is proposed.

Mitigation Measure CR-1: Disturbance of Undiscovered Cultural Resources.

During the course of ground-disturbing activities associated with Project implementation, if any cultural resources are discovered, work shall be halted immediately within 66 feet of the discovery, and the Humboldt County Planning Department shall be immediately notified. At that time, the county will coordinate any necessary investigation and evaluation of the discovery with a qualified archaeologist. If the archaeological resources are Native American, representatives of the appropriate culturally affiliated tribe shall also be enlisted to help evaluate the find and suggest appropriate treatment.

The county shall consult with the archaeologist and agree upon implementation of treatment of the resources that is deemed appropriate and feasible. Such treatment may include avoidance, curation, documentation, excavation, preservation in place, or other appropriate measures.

Level of Significance: Less than significant after mitigation.

Mitigation measure CR-1 would reduce potentially significant impacts on undiscovered cultural resources to a less-than-significant level by providing a process for evaluation of any unknown resources encountered during construction, and avoidance or data recovery of resources that meet

the CEQA definition of historical or unique archaeological resources. This mitigation measure is in accordance with Humboldt County General Plan Policies 3531 (1, 4, and 5).

Impact CR-2: Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

There are no known unique paleontological resources or geologic features on the Project site. Because the sand dunes are relatively new geologically, and river flooding over the decades has resulted in silt deposits, the likelihood of the proposed Project affecting paleontological resources is low. However, there is the possibility of unanticipated discovery of paleontological resources during ground-disturbing activities associated with construction of the Project. Implementation of the Project could impact significant paleontological resources. Impacts to unknown paleontological resources would be a significant impact, therefore, the following mitigation is proposed.

Mitigation Measure CR-2: Potential Disturbance of Undiscovered Paleontological Resources.

During the course of ground-disturbing activities associated with Project implementation, if any paleontological resources are discovered, work shall be halted immediately within 66 feet of the discovery, and the Humboldt County Planning Department shall be immediately notified. At that time, the county will coordinate any necessary investigation of the discovery with a qualified paleontologist.

The county shall consider the mitigation recommendations of the qualified paleontologist for any unanticipated discoveries of paleontological resources. The county shall consult with the paleontologist and agree upon implementation of a measure(s) that are deemed appropriate and feasible. Such mitigation measures may include avoidance, curation, documentation, excavation, preservation in place, or other appropriate measures.

Level of Significance: Less than significant after mitigation.

Mitigation Measure CR-2 would reduce potentially significant impacts on undiscovered paleontological resources to a less-than-significant level by providing a process for evaluation of any unknown resources encountered during construction, and avoidance or data recovery of resources that meet the CEQA definition of unique paleontological resources.

Impact CR-3: Would the Project disturb any human remains, including those interred outside of formal cemeteries.

While no evidence exists for the presence of historic or prehistoric burials at the Project site, this does not preclude the existence of buried subsurface human remains. If any human remains were unearthed during Project construction, particularly those that were determined to be Native American, a potentially significant disturbance of human remains would occur, therefore, the following mitigation is proposed.

Mitigation Measure CR-3: Potential to Uncover Human Remains.

If construction activities result in the discovery of human remains during ground disturbing activities, in accordance with California Health and Safety Code Section 7050.5, no further disturbance shall occur until the Coroner has made a determination of origin and disposition pursuant to PRC Section 5097.98. The Coroner shall be notified of the find immediately. If the human remains are determined to be prehistoric, the Coroner shall notify the NAHC, which shall determine and notify a Most Likely Descendant. The Most Likely Descendant shall complete the

inspection of the site within 48 hours of notification and may recommend scientific removal and non-destructive analysis of human remains and items associated with Native American burials.

Level of Significance: Less than significant with mitigation.

Mitigation measure CR-3 would reduce potentially significant impacts on uncovering human remains to a less-than-significant level by providing direction on who to notify in the event human remains are found.

Impact CR-4: Would the Project cause a substantial adverse change in the significance of a tribal cultural resource as defined in Public Resources Code 21074.

CEQA requires lead agencies to determine if a proposed project would have a significant effect on tribal cultural resources. The CEQA Guidelines define tribal cultural resources as: (1) a site, feature, place, cultural landscape, sacred place, or object with cultural value to a California Native American Tribe that is listed or eligible for listing on the California Register of Historical Resources, or on a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or (2) a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant according to the historical register criteria in Public Resources Code Section 5024.1(c), and considering the significance of the resource to a California Native American tribe.

As of the date of this DEIR, no tribes have requested to be on the Agency's Notice List. However, consultation (prior to AB52's implementation) initiated by Roscoe and Associates included a letter faxed to the NAHC on September 23, 2013. The NAHC was asked to search their Sacred Lands Inventory File and to provide a list of Native American representatives for the Project area. The NAHC replied on October 2, 2013 that no sacred lands were present within the Project area and provided a list of interested Native American tribes near the Project area. A letter was sent to all representatives on the NAHC list on September 26, 2013, and again on January 12, 2016. Thomas Torma PhD, THPO for the Wiyot Tribe, responded on October 8, 2013, "…the Tribes cultural information on this area, beyond information contained in site Loud AQ, is currently missing –this is especially distressing as the tribe owns property on Cock Robin Island. I wish you best of luck on the survey and look forward to seeing it. We also look forward to being future neighbors with the preserve." Erika Collins M.A., THPO for the Bear River Band of the Rohnerville Rancheria, replied on October 8, 2013 "A review of Bear River's cultural resource database did not identify any previously recorded cultural resources within the Project area. We have record of one previously recorded site Loud AQ) approximately ¾ mile outside of the Project area's northwest edge. Please let me know when you plan to schedule the fieldwork; if possible either Eli or I would like to join you for some of the survey." Ms. Collins participated in the field survey on February 12, 2014. Janet Eidsness M.A., (THPO, Blue Lake Rancheria), responded on October 8, 2013, "Note the Project is located outside Blue Lake Rancheria's mapped area of concern for tribal resources. No need to consult with me further about this Project."

As noted previously, Samuel Schuchat, Executive Officer of the Coastal Conservancy, contacted Stephen Kullman, Natural Resources Director for the Wiyot Tribe to seek Wiyot guidance on development of the DEIR, and to inquire if the Wiyot would like to initiate government-to-government consultation. By letter sent August 2, 2016, Mr. Schuchat provided the NOP, outlined the Project, and provided contact information for future communications.

Because the Project site is not located on or adjacent to known tribal cultural resources, there would be no potential impact associated with such resources.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.5.6 Cumulative Impacts

Impact CR-C-1: Would the Project result in cumulative impacts to cultural resources.

There are no known cultural resources that would be impacted by the Project. As described in this EIR, appropriate studies were undertaken to ensure that cultural resources that could be impacted by the Project were identified, and that mitigation measures are put forth that would reduce the impacts to unknown cultural resources to a less-than-significant level. These measures are consistent with Humboldt County General Plan Policies 3531 (1, 4, and 5) and Public Resources Code 7050.5 and 5097. Therefore, the Project's incremental effect to cultural resources is not cumulatively considerable and would not contribute to any significant impacts to cultural resources that may be caused by other cumulative Projects.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.5.7 References

Roscoe and Associates, 2016, *A Cultural Resources Investigation for the Connick and Russ Ranches, Eel River Estuary and Centerville Slough Enhancement Project, Humboldt County, California*, prepared for California Trout, June.

Van Kirk, 2008, *Historic Resources Survey, Salt River Project*, prepared for Roscoe and Associates, A Cultural Resources Investigation of the Salt River Ecosystem Restoration Project; Located Near Ferndale, Humboldt County, California, February.

Van Kirk, 2013, *Loleta Creamery Historic Resources Report*, prepared for Peter van der Zee.

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3.6 Geology and Soils

This section evaluates the potential impacts related to geology and soils. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential geological impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels. A geotechnical investigation conducted by LACO Associates (LACO) in support of the design and construction of the proposed Project is used throughout this section (LACO 2016) as well at the Eel River Coastal Plain Dunes Assessment and Restoration Feasibility Analysis (Appendix C).

3.6.1 Setting

Geologic Setting

The regional geology of the Project area is characterized by: the depositional history of the Eel River basin, dynamic tectonic processes driving uplift of the Wildcat Hills and subsidence of the Eel River Valley, and frequent seismic activity (reference Figure 3.6-1 – Regional Geologic Setting).

Surficial geology of the Wildcat Hills consists primarily of Quaternary and Tertiary aged sedimentary rocks in the Wildcat Group. Sediments composing the Wildcat Group were deposited in the Eel River embayment between about four and 11 million years ago (Ogle 1953). The Wildcat Group is divided among five discrete formations with rock types that include mudstone, siltstone, and sandstone. Mudstone is the most common rock type (Ogle 1953). These rocks make up the upland Wildcat Hills.

Surficial geology of the Eel River delta is divided between alluvium and terrace deposits Quaternary in age. The terrace deposits and alluvium deposited near the Eel River channel are typically composed of coarse material such as sand (reference Figure 3.6-2 – Project Area Geology).

The seismic setting of the Project area is unique due to its location near the junction of three crustal plates known as the Mendocino Triple Junction. South of the triple junction the Pacific plate meets the North American Plate along a boundary marked by the San Andreas Fault Zone. North of the Triple Junction, including the area just offshore from the Project area, the Gorda plate meets the North American plate at a boundary forming the southern end of the Cascadia subduction zone. Physiographic characteristics of the region reflect structural deformation caused by the underthrusting of the Gorda Plate and northward migration of the Triple Junction. Key features of this deformation are the downwarping of the crust to produce a tectonic uplift of the Wildcat Hills that has created the steep mountainous terrain that rises high above the broad plain of the Eel River delta.

The Eel River delta formed by depositional processes as the river channel migrated across the Eel River Valley. The channel has likely shifted positions within the valley numerous times during the development of the delta.

Soils

Soils in the Project area are derived from alluvial materials. Soil characteristics vary spatially across the landscape and reflect differences in the depositional history and drainage. The most widespread soil type on the Eel River delta is a poorly drained silt loam. Depressional (low) areas on the delta commonly have soils with a higher clay content, silty clay loam, and are very poorly drained. There are pockets of sandier soils, fine sandy loam, present on natural levee features that remain on the delta. The sandier soils are well drained.

According to the Geotechnical Report, shallow soils underlying much of the Project area primarily consist of geologically young, unconsolidated, silts and clays (USCS: ML, CL, OL, CH, OH) with minor amounts of poorly graded sands (SP), silty sands (SM) and peat (PT). All of the soils within the Project area represent relatively young, soft/loose, tidal marsh, alluvial, aeolian and beach deposits.

Seismic Hazards

Seismic hazards include those hazards that could reasonably be expected to occur at the Project site during a major earthquake on any of the regional faults. Some hazards can be more severe than others, depending on the location, underlying materials, and level of ground shaking.

Surface Fault Rupture

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude and nature of fault rupture can vary for different faults or even along different strands of the same fault. Surface rupture can damage or collapse buildings, cause severe damage to roads and pavement structures, and cause failure of overhead as well as underground utilities. As a result of the damage, buildings could become uninhabitable, roads could close, and utility service could be disrupted for an undetermined length of time. Ground rupture is typically confined to relatively narrow zones (a few feet to tens of feet wide) and considered more likely along active faults. The Project area does not fall within an Alquist-Priolo Fault Rupture Hazard Zone Map, as designated through the Alquist-Priolo Earthquake Fault Zoning Act (CGS 2007).

According to the geotechnical report, the Project site is within a seismically active region which is subject to frequent moderate to large earthquakes. Although not within a "Fault Rupture Hazard Zone" or within an area currently designated as a "Seismic Hazard Zone" by the State of California, numerous faults of various activity levels are within 50 kilometers of the site.

Ground Shaking

Earthquakes on active faults have the capacity to produce a range of ground shaking intensities at the Project site. Ground shaking may affect areas hundreds of miles distant from an earthquake's epicenter. Ground motion during an earthquake is described by the parameters of acceleration and velocity as well as the duration of the shaking. A common measure of ground motion is the peak ground acceleration (PGA). The PGA for a given component of motion is the largest value of horizontal acceleration obtained from a seismograph. PGA is expressed as the percentage of the acceleration due to gravity (g)[1]. Moderate earthquake hazard areas are defined as areas with ground accelerations of less than .092g and Violent earthquake hazard areas have ground accelerations of .65g to 1.24g.

According to the California Geologic Survey (CGS), there is a 10 percent chance that the Project site will experience ground shaking of 0.66g or more, within the next 50 years (CGS 2008).

Liquefaction, Lateral Spreading and Subsidence

Liquefaction is a phenomenon whereby unconsolidated and/or near-saturated soils lose cohesion and are converted to a fluid state as a result of severe vibratory motion. The relatively rapid loss of soil shear strength during strong earthquake shaking results in temporary, fluid-like behavior of the soil. Soil liquefaction causes ground failure that can damage roads, pipelines, underground cables and buildings with shallow foundations.

[1] Acceleration of gravity (g) = 980 centimeters per second squared; 1.0g of acceleration is a rate of increase in speed equivalent to a car traveling 328 feet from rest in 4.5 seconds.

The consequences of strong seismic shaking within the Project area will likely include liquefaction, and related dynamic settlement and/or lateral movement. As presented on Map S-2 of Special Publication 115 (CDMG 1995), the Project site is in an area with a high liquefaction potential. Quantitative liquefaction analysis for a project adjacent to the restoration area, and underlain by similar soils, indicates that the unconsolidated alluvium underlying the Ferndale bottoms is susceptible to liquefaction (SHN 2009). Typical consequences of liquefaction at sites with similar subsurface characteristics include sand boils (liquefied soil ejected to the ground surface), ground cracking associated with blocks of cohesive soils “floating” on the underlying liquefied soil, lateral spreading of soils down-gradient toward unsupported slopes, and/or dynamic settlement.

Subsidence (e.g., settlement) is the depression of the bearing soil when a load, such as that of a building or new fill material, is placed upon it. Subsidence could occur if loose, saturated sands near the ground liquefy during severe ground shaking.

Geologic Hazards

Slope Failure and Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Earthquake motions can induce significant horizontal and vertical dynamic stresses in slopes that can trigger failure. Earthquake-induced landslides can occur in areas with steep slopes that are susceptible to strong ground motion during an earthquake.

The Project site is characterized by flat terrain except for the dunes along the Project site’s western boundary, therefore, landslide hazards to the planned structures are considered to be low. The nearest slopes having a gradient of 25 percent or greater are the Wildcat Hills south of the Project site. Landslides are a prevalent geologic hazard in the Wildcat Hills due in part to the steep, rugged topography, relatively high rainfall, unstable geological structure, and high rates of tectonic activity. Rocks in the Wildcat Group are prone to erosion and contribute to the high potential for landslides. The Rio Dell Formation, in particular, is soft and erodible and landslide failures are common along the interface between beds of mudstone and sandstone.

Expansive Soils

Expansive soils possess a “shrink-swell” characteristic. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying. Structural damage may occur over a long period of time due to expansive soils, usually the result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils.

Soil Erosion

Soil erosion is a process whereby soil materials are worn away and transported to another area, either by wind or water. Areas susceptible to erosion occur where surface soils possess low-density and/or low-strength properties. Slopes are another factor in soil erosion – the greater the slope, the greater the erosion hazard, especially if the soil is bare of vegetation. With the exception of the existing channels, embankment, and dune side slopes, slope gradients in the vicinity of the Project area are generally flat (less than 5 percent).

3.6.2 Regulatory Framework

Federal

There are no federal policies or regulations relevant to the Project for geology and soils.

State

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called “earthquake fault zones,” around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Because many active faults are complex and consist of more than one branch, each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace.

Title 14 of the California Code of Regulations (CCR), Section 3601(e), defines buildings intended for human occupancy as those that would be inhabited for more than 2,000 hours per year. The proposed Project site does not cross an Alquist-Priolo Earthquake Fault Zone (CGS 2007), and does not include buildings that meet this criterion for human occupancy. Therefore, the provisions of the act do not apply to the Project.

Seismic Hazards Mapping Act

Like the Alquist-Priolo Act, the Seismic Hazards Mapping Act of 1990 (Public Resources Code [PRC] Sections 2690 to 2699.6) is intended to reduce damage resulting from earthquakes. While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong groundshaking, liquefaction and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act: the state is charged with identifying and mapping areas at risk of strong groundshaking, liquefaction, landslides, and other corollary hazards, with cities and counties required to regulate development within mapped Seismic Hazard Zones.

Under the California Seismic Hazards Mapping Act, permit review is the primary mechanism for local regulation of development. Specifically, cities and counties are prohibited from issuing development permits for sites within Seismic Hazard Zones until appropriate site-specific geologic and/or geotechnical investigations have been conducted and measures to reduce potential damage have been incorporated into the development plans. The California Geological Survey has not yet evaluated the Project site or surrounding area under the Seismic Hazards Mapping Act.

California Building Code

The State of California provides minimum standards for building design through the California Building Code (CBC). Where no other building codes apply, CBC Chapter 29 regulates excavation, foundations, and retaining walls. The CBC applies to building design and construction in the state and is based on the federal Uniform Building Code (UBC) used widely throughout the country. The CBC has been modified for California conditions with numerous more detailed and/or more stringent regulations. Specific minimum seismic safety and structural design requirements are set forth in CBC Chapter 16. The Code identifies seismic factors that must be considered in structural design. Chapter 18 of the CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and areas subject to liquefaction.

Regional and Local

Humboldt County General Plan Goals and Policies

The following are the goals and policies from the *Humboldt County General Plan* and *Eel River Area Plan* that are applicable to the Project.

3290 Goals

1. To reduce public exposure to natural and manmade hazards.

3291 Policies

1. General. A. Regulate land use to ensure that development in potentially hazardous areas will not preclude preserving and promoting public safety. Potentially hazardous areas include, but are not limited to, steep slopes, unstable soils areas, on active earthquake fault lines, in extreme wildland fire areas, in airport flight path zones, and in flood plains and tsunami runup areas.

B. Development within the coastal zone shall minimize risks to life and property in areas of high geologic, flood and fire hazard, assure stability and structural integrity and neither create nor contribute significantly to erosion, geologic instability or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

2. Geologic. A. Provide for the identification and evaluation of existing structural hazards.

Eel River Area Plan

3.28 Hazards

A. Development Policies

30253 New Development Shall:

1. *Minimize risks to life and property in areas of high geologic, flood and fire hazard.*
2. *Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*

3.6.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to geology and soils, as defined by the CEQA Guidelines (Appendix G), if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving 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, strong seismic ground shaking, seismic-related ground failure, including liquefaction, or landslides;
- Result in substantial soil erosion or the loss of topsoil;
- 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;
- 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; or
- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Area of No Project Impact

As explained below, the Project would not result in impacts related to some of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving 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?** The Project is not located within an active or potentially active fault zone, and is not located within a special studies zone or an Alquist-Priolo Fault Rupture Hazard Zone Map. Therefore, this significance criterion is not applicable to the Project and is not discussed further.
- **Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving landslides, or 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 landslides?** The Project site is characterized by flat terrain except for the dunes portion of the site, therefore, landslide hazards to the planned structures are considered to be low. The nearest slope having a gradient of 25 percent or greater is the Wildcat Hills south of the Project site and Centerville Road. Because of the flat terrain, the Project is not anticipated to result in on- or off-site landslides, and no impact would occur. Therefore, this significance criterion is not applicable to the Project and is not discussed further.
- **Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?** The Project would not include the use of septic tanks or alternative wastewater disposal systems. Therefore, this significance criterion is not applicable to the Project and is not discussed further.

3.6.4 Methodology

The descriptions of geology and soils in this section rely on information gathered from the USGS, the Natural Resources Conservation Service (NRCS), the CGS, the Salt River Ecosystem Restoration Project EIR, and the preliminary geotechnical report prepared for the Project. This section also incorporates previous research and analyses provided in the Humboldt County General Plan and the preliminary geotechnical report prepared for the Project. This information was reviewed to determine relevant information for the EIR analysis. Project activities are evaluated for their potential to be affected by, or to increase, risks associated with identified geologic and seismic hazards. Appropriate mitigation measures are identified for impacts determined to be significant.

3.6.5 Impacts and Mitigation Measures

Impact GEO-1: Expose People or Structures to Potential Substantial Adverse Effects Involving Strong Seismic Ground Shaking or Seismic-related Ground Failure, including Liquefaction.

Past seismic history suggests that the Project area is susceptible to moderate to strong seismic ground shaking (LACO 2016). The Project includes reinforced structures that would be at risk of collapse from groundshaking, and road (haul roads and access roads) improvements that would be susceptible to damage during strong seismic ground shaking. The Project site is in an area with a

high liquefaction potential. Quantitative liquefaction analysis indicates that the unconsolidated alluvium underlying the Ferndale bottoms is susceptible to liquefaction. The potential impact from liquefaction is considered significant.

Project design would be required to conform to the Humboldt County Code, CBC, and the State Earthquake Protection Law, which set design criteria for seismic resistant structures and construction in areas with liquefiable soils. The impact related to strong seismic ground shaking or seismic-related ground failure including liquefaction is potentially significant. Therefore, the following mitigation is included to reduce potential impacts to a less than significant level.

Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.

The California State Coastal Conservancy shall ensure that the Project is designed to comply with the recommendations in the Project's Geotechnical Report (LACO 2016) to ensure seismic stability and adherence to the CBC. The geotechnical recommendations are proposed to be incorporated in the final plans and specifications and implemented during construction. Professional inspection by a qualified engineer or geologist of foundation and excavation, earthwork and other geotechnical aspects of site development shall be performed during construction in accordance with the current version of the CBC.

Level of Significance: Less than significant with mitigation.

Mitigation Measure GEO-1 would reduce impacts to a less-than-significant level by requiring adherence to the recommendations in the geotechnical report so that the Project is designed and constructed in conformance with applicable design standards that would reduce the risk to life or property during a seismic event.

Impact GEO-2: Result in Substantial Soil Erosion or Loss of Topsoil.

Grading, earthwork, and stockpiling during construction and maintenance could result in increased potential for erosion or loss of topsoil on and off-site, which would be a potentially significant impact. With the exception of the existing channels, embankment, and dune side slopes, slope gradients in the Project area are generally flat (less than 5 percent). Most Project actions are designed to reduce/control flooding hazards and susceptibility of soil to erosion or loss of topsoil. All soil areas disturbed during construction would be treated with adequate erosion control BMPs and revegetated to further ensure long-term stabilization pursuant to the SWPPP that would be prepared in compliance with Mitigation Measure HWQ-1a (Manage Construction Storm Water). Additional mitigation that would address protecting water quality from Project actions are provided in the Hydrology and Water Quality section (Section 3.9) and include: Mitigation Measure HWQ-1b (Implement Contractor Training for Protection of Water Quality); Mitigation Measure HWQ-1c (In-Stream Erosion and Water Quality Control Measures during Channel Excavation and Operations); and Mitigation Measure HWQ-3 (Implement Erosion and Water Quality Monitoring, Maintenance and Adaptive Management Plan). Levees, berms, access and haul roads, would be constructed with adequate BMPs to ensure immediate protection from erosion and also would include design components (e.g., erosion-resistant vegetation, aggregate base rock for access and haul roads) as needed to ensure long-term stability. Therefore, with implementation of mitigation measures identified below, the impact would be less than significant.

Mitigation Measures:

- HWQ-1a - Manage Construction Storm Water
- HWQ-1b - Implement Contractor Training for Protection of Water Quality

- HWQ-1c - In-Stream Erosion and Water Quality Control Measures during Channel Excavation and Operations
- HWQ-3 - Implement Erosion and Water Quality Monitoring, Maintenance and Adaptive Management Plan, and
- GEO-1: Implement Recommendations in the Geotechnical Report.

Level of Significance: Less than significant with mitigation.

Impact GEO-3: Be Located on Geologic Unit or Soil that is Unstable, or would become Unstable as a Result of the Project, and Potentially Result in Liquefaction, Lateral Spreading, Subsidence, or Collapse.

Soils in the Project area are susceptible to liquefaction (LACO 2016). Because of the potential for liquefaction, the Project site is potentially susceptible to lateral spreading from liquefaction. Subsidence from liquefaction also could occur. Tidegates, berms, access and haul roads, and bridges could be susceptible to damage or collapse. The impact would be potentially significant. Therefore, Mitigation Measure Geo-1 is included to reduce potential impacts to a less than significant level.

Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.

Level of Significance: Less than significant with mitigation.

Mitigation Measure GEO-1 would reduce potential impacts from liquefaction, lateral spreading, subsidence, or collapse to a less-than-significant level by requiring adherence to the recommendations in the geotechnical report so that the Project is designed and constructed in conformance with applicable design standards that would reduce the risk to life or property during a seismic event.

Impact GEO-4: Be Located on Expansive Soil, as Defined in Table 18-1-B of Uniform Building Code (1994), Creating Substantial Risks to Life or Property.

According to the geotechnical report prepared for the Project (LACO 2016), borings excavated along Centerville Slough, the proposed Russ Creek Channel alignments, and in the Inner Marsh identified moderate to highly plastic clays. Expansive soils can damage structures and foundations. This would be a potentially significant impact. Therefore, Mitigation Measure GEO-1 is included to (e.g., recommendations for foundations, seismic design parameters, grading, structural fill, channel excavation, dune rebuilding, levee berm, construction, repair and improvement, and culvert pipe installation) ensure that potential impacts from conducting Project activities in expansive soils are reduced to a less than significant level.

Mitigation Measure GEO-1: Implement Recommendations in the Geotechnical Report.

Level of Significance: Less than significant with mitigation.

Mitigation measure GEO-1 would reduce potential impacts from Project activities in expansive soils to a less-than-significant level by requiring a site-specific geotechnical report and design and construction in conformance with applicable design standards that would reduce the risk to life or property due to expansive soils.

3.6.6 Cumulative Impacts

Impact GEO-C-1: Project Plus Cumulative Projects Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Geology and Soils.

The nature of geologic impacts is largely site-specific. Therefore, geologic hazards do not accumulate as impacts on other resources do, as indicated in other sections of this EIR. The Project would comply with state and local regulations and policies, and Mitigation Measure GEO-1 would be implemented to reduce the risk to life and property from potential geologic hazards. There would be no contribution to a cumulative impact related to geologic impacts.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.6.7 References

California Division of Mines and Geology (CDMG), 1995, *Planning Scenario in Humboldt and Del Norte Counties, California, for a Great Earthquake on the Cascadia Subduction Zone*, SP 115.

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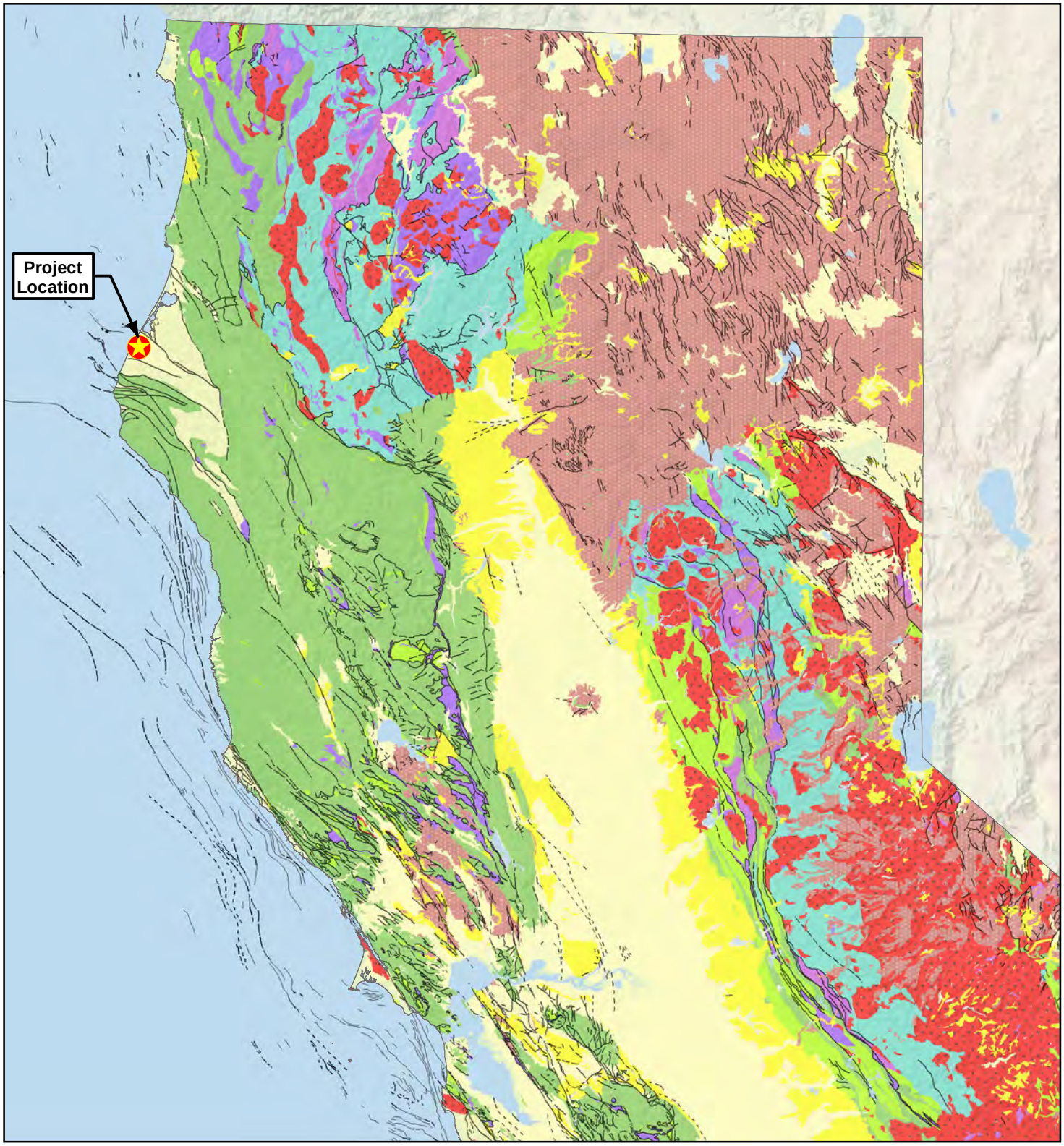

Franciscan Complex; marine sedimentary and metasedimentary rocks (Cretaceous-Jurassic)

marine and nonmarine (continental) sedimentary rocks (Pleistocene-Holocene)

nonmarine (continental) sedimentary rocks (Pleistocene-Holocene); Tc

Mesozoic sedimentary and volcanic rocks, some strongly metamorphosed

Volcanic rocks (Cenozoic)

Paleozoic metasedimentary and metavolcanic rocks; sch; ls

pre-Cenozoic metamorhpic rocks

Granitic Rocks (mostly Mesozoic to pre-Cambrian)

Ultramafic rocks (Mesozoic)

Fault line location

fault, certain

fault, approx. located

fault, concealed

Paper Size 8.5" x 11" (ANSI A)

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Miles

Map Projection: Albers

Horizontal Datum: North American 1983

Grid: NAD 1983 California Teale Albers

N

Eel River Estuary and Centerville Slough Enhancement Project

Job Number	8410882.03
Revision	A
Date	05 Apr 2016

Regional Geologic Setting

Figure 3.6-1

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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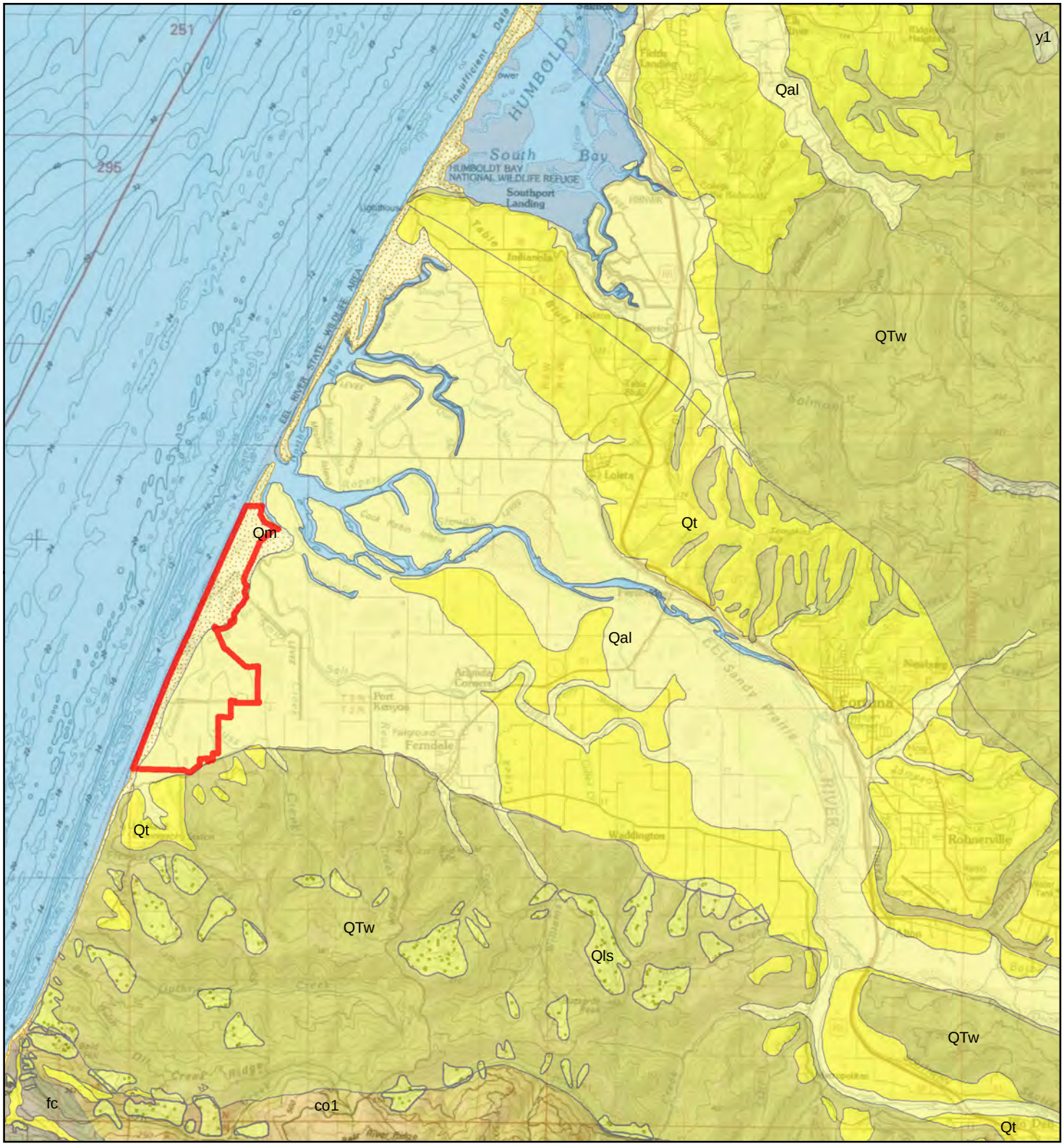

Project Area	Qal Aluvial Deposits	Qt Nonmarine Terrace Deposits	fc Rio Dell Formation
QTw Marine Wildcat Group	Qls Landslide Deposits	co1 Carlotta Formation	y1 Yager Formation
	Qm Dune Sands		water

Paper Size 8.5" x 11" (ANSI A)

0 0.5 1 1.5 2

Miles

Map Projection: Transverse Mercator
Horizontal Datum: Clarke 1866
Grid: Clarke 1866 UTM Zone 10N

Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882.03
Revision A
Date 04 Apr 2016

Project Area Geology

Figure 3.6-2

718 Third Street Eureka CA 95501 USA T 707 443 8326 F 707 444 8330 E eureka@ghd.com W www.ghd.com

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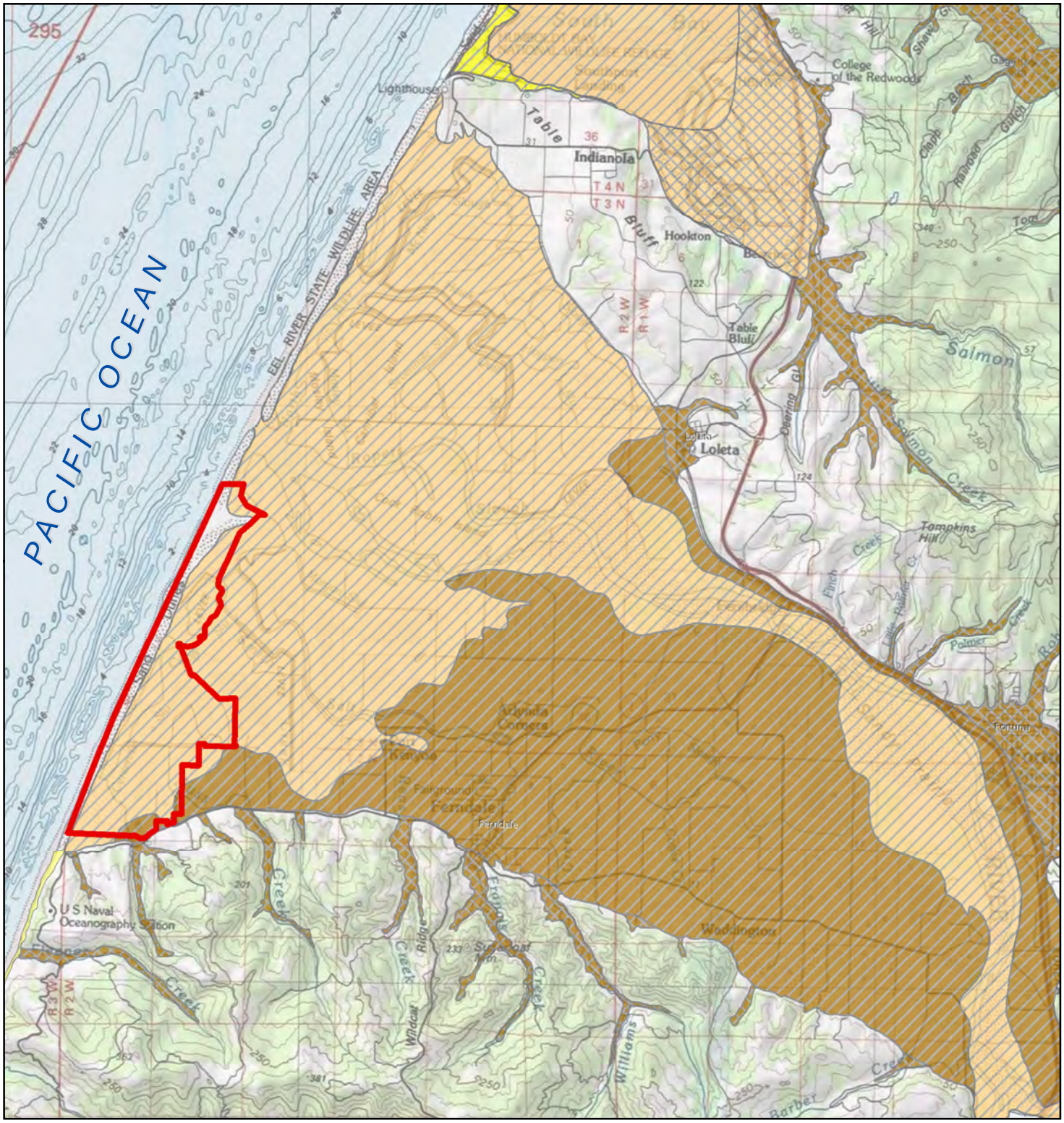

Project

Moderate Instability, Recent deposits at surface, Deep alluvium

Moderate Instability, Recent deposits at surface, Shallow alluvium

Relatively Stable, Recent deposits at surface, Deep alluvium

Relatively Stable, Recent deposits at surface, Shallow alluvium

Relatively Stable, Older deposits at surface, Deep alluvium

Relatively Stable, Older deposits at surface, Shallow alluvium

Paper Size 8.5" x 11" (ANSI A)

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Miles

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

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Eel River Estuary and Centerville Slough Enhancement Project

Project Area Liquefaction

Job Number	8410882.03
Revision	A
Date	04 Apr 2016

Figure 3.6-3

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3.7 Greenhouse Gas Emissions

This section evaluates the potential impacts related to greenhouse gas (GHG) emissions during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the existing setting with regard to GHG emissions for the Project area and the regulatory framework section describes the regulatory background that applies to the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates GHG impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to a less than significant level.

3.7.1 Setting

The City of Ferndale, population approximately 1,456, is the population center in the Project area. Most land is privately owned. The lower watershed is primarily dairy and beef cattle operations, and the upper watershed is primarily utilized for timber operations and cattle and sheep ranching.

Gases that trap heat in the atmosphere are referred to as GHGs because they capture heat radiated from the sun as it is reflected back into the atmosphere, much like a greenhouse. The accumulation of GHGs has been implicated as the driving force for global climate change. The primary GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O).

While GHGs in the atmosphere are naturally occurring, the emission rate of CO_2, CH_4 and N_2O has been accelerated by human activities. Emissions of CO_2 are largely a by-product of fossil fuel combustion, whereas CH_4 results from off-gassing associated with such activities as agricultural practices and landfills. Other GHGs include hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride, which are generated during certain industrial processes. GHGs are typically reported in “carbon-dioxide-equivalent” (CO2e) measures.

There is international scientific consensus that human-caused increases in GHGs have contributed, and will continue to contribute, to climate change. Probable climate change impacts in California include, but are not limited to, a decrease in snowpack; sea level rise; a greater number of extreme heat days per year, high ozone days, large forest fires, and drought years. Secondary effects are likely to include impacts on agriculture, changes in disease vectors, and changes in habitat and biodiversity.

The Environmental Protection Agency (EPA) reports U.S. GHG emissions for 2014 as 6,870 million metric tons of $CO2_e$ (MMT $CO2_e$). Electricity production accounted for 30 percent, followed by the transportation sector at 26 percent and the industry sector at 21 percent. Commercial and residential fuel use and the agricultural sector accounted for the remaining 21 percent (U.S. EPA 2016).

The California Air Resources Board (CARB) estimated that in 2013 California produced about 459 MMT CO_2e. The transportation sector was the highest source at 37 percent of the state’s total GHGs, followed by the industrial sector at 23 percent, and electricity generation (both in-state and out-of-state) at 20 percent. Agriculture, residential, commercial, and the “Not Specified” sectors accounted for the remaining 20 percent of the state’s total GHGs (CARB 2015).

The Project area is privately owned and in active agricultural production. One of the distinctive attributes about land use in the temperate north coast area is that the agricultural sector here is largely self-sufficient. Producers enjoy productive pastures that do not depend on extensive fertilization, the importation of fertilizers or forage from afar, or other practices that traditionally

increase the GHG impact of agricultural/livestock operations. The majority of dairies surrounding the Project area are organic operations and more than 50 percent of producers in the area have developed and implemented comprehensive nutrient management plans. Proper nutrient management practices serve to lower GHG emissions. A number of local dairies are also installing methane digesters that reduce emissions of this very harmful greenhouse gas, while also reducing energy consumption levels necessary for lighting, chilling equipment and other intensive energy consumers.

Thus, due to its low demand for fossil fuels for transportation of feed, lack of air conditioning for livestock as is needed in some hotter climates, and nearly nonexistent use of fossil fuel based fertilizers, the agricultural industry here produces significant levels of high quality dairy and beef products with low GHG emissions relative to other areas. The community is striving to balance ecosystem restoration capable of carbon sequestration with preservation of an agricultural economy and heritage.

3.7.2 Regulatory Framework

Federal

There are no federal regulations that apply to this type of Project as related to GHG emissions.

State

In 2006, the Governor signed AB32, the “Global Warming Solutions Act of 2006,” committing the State of California to reducing GHG emissions to 1990 levels by 2020. The statute requires CARB to track emissions through mandatory reporting, determine the 1990 emission levels, set annual emissions limits that will result in meeting the 2020 target, and design and implement regulations and other feasible and cost effective measures to ensure that statewide GHG emissions will be reduced to 1990 levels by 2020.

In December 2007, CARB approved the 2020 emissions limit at 427 MMT CO_2e. Projected business-as-usual emissions for 2020 are 507 MMT CO_2e. Therefore, a reduction of 80 MMT CO_2e is needed to meet the goal (CARB 2012).

In December 2008, pursuant to AB 32, CARB adopted the *Climate Change Scoping Plan*, which outlined measures to attain the 2020 GHG emissions limit. The Climate Change Scoping Plan estimated that implementation of identified measures would result in a reduction of 105.3 MMT CO_2e from various sectors including transportation, energy, forestry, and high global warming potential gas sectors (originally reported as 174 MMT CO_2e, but updated to 105.3 MMT CO_2e in the Status of Scoping Plan Recommended Measures found at the CARB website). This is 24 percent more than is needed to meet the 2020 mandate.

In May 2014, CARB released the *First Update to the Climate Change Scoping Plan* which describes the progress made to meet the near-term (2020) objectives of AB 32 and defines California’s climate change priorities and activities for the next several years (CARB 2014). The Plan also updated the 2020 emissions limit and business-as-usual emissions for 2020. The 2020 limit is now 431 MMT CO_2e and the business-as-usual forecast is 509 MMT CO_2e. Finally, the plan provides recommendations for establishing a mid-term emissions limit that aligns with the long-term reduction goals of Executive Order (EO) S-3-05 (signed by then Governor Schwarzenegger, EO S-3-05 establishes GHG reduction targets for 2050). The recommendations cover the Energy, Transportation, Agriculture, Water, Waste Management, Natural and Working Lands, Short-lived Climate Pollutants, Green Building, and Cap-and-Trade sectors.

Regional and Local

North Coast Unified Air Quality Management District

The NCUAQMD is a regional environmental regulatory agency with jurisdiction over Humboldt County. The NCUAQMD enforces local, state and federal air quality regulations and air quality permits.

In 2011, the North Coast Unified Air Quality Management District (NCUAQMD) adopted Rule 111 (Federal Permitting Requirements for Sources of Greenhouse Gases) into the District rules, to establish a threshold above which New Source Review (NSR) and federal Title V permitting applies, and to establish federally enforceable limits on potential to emit GHGs for stationary sources. This Project does not include any new stationary sources; therefore, Rule 111 would not apply.

The NCUAQMD has not adopted regulations regarding the evaluation of GHG emissions in a CEQA document. Nor has the NCUAQMD established CEQA significance criteria to determine the significance of impacts with regard to GHGs that would result from projects such as the proposed Project.

For construction emissions, the NCUAQMD has indicated that emissions are not considered significant for projects whose construction will be of relatively short in duration, lasting less than one year (e.g., the proposed Project), and of average construction intensity. For project construction lasting more than one year or that involves above average construction intensity in volume of equipment or area disturbed, construction emissions may need to be discussed with Air District staff to determine a project specific approach. (NCUAQMD 2016)

3.7.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to GHG emissions, as defined by the CEQA Guidelines (Appendix G), if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

3.7.4 Methodology

The GHG emissions impact analysis considers construction and operation impacts associated with the proposed Project, weighing them against the carbon sequestration capacity of the restored Project area. There are currently no applicable federal, state, or local significance thresholds pertaining to construction activities. Therefore, the analysis of construction-related GHG emissions uses a qualitative approach in accordance with Section 15064.4(a)(2) of the CEQA Guidelines.

For determining a conflict with an applicable plan, the Project is evaluated for its compliance with the state's *First Update to the Climate Change Scoping Plan* (the implementing tool of AB 32) the one plan adopted for the purpose of reducing GHG emissions which also is applicable to the Project area. There are no County-level plans that have been adopted for the purpose of reducing GHG emissions.

GHG emissions, by their nature, represent a cumulative impact. No single project could generate enough greenhouse gas emissions to noticeably change the global average temperature. Instead, GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts

of global climate change. Therefore, the Project analysis is discussed in the context of the cumulative impact.

3.7.5 Impacts and Mitigation Measures

Impact GG-1: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

Project construction activities would result in a temporary increase in GHG emissions, including exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy-duty equipment. Construction would require clearing, earthmoving, hauling, and delivery equipment, as used for similar projects, and which have been accounted for in the state's emission inventory and reduction strategy for both on and off-road vehicles. Construction emissions are estimated to be 1,658 metric tons of CO_2 from construction activities. Because the emissions would be temporary, and vehicle emissions are already accounted for in the State's inventory, the impact from construction GHG emissions would be less than significant.

Additionally, once the Project is completed and vegetation has established in restored habitats, the Project would result in approximately 100 to 200 tons CO_2 equivalent in net emissions reductions and new carbon sequestration annually. This would be achieved through a combination of converting pasture and restoring reclaimed tidal marsh back to marsh conditions.

During operation of the Project, some GHG emissions would occur from worker trips and equipment as a result of maintenance activities. These activities would be infrequent and short-term in nature. In addition, they are anticipated to be no greater than the traditional maintenance historically performed on these lands.

GHG emissions related to operation of the Project are considered less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than Significant.

Impact GG-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

The recommended next steps in the *First Update to the Climate Change Scoping Plan* (Scoping Plan) are broad policy and regulatory initiatives that will be implemented at the State level and, in general, do not relate to the construction and operation of an individual project such as the Eel River Estuary Project. Although Project construction may benefit from implementation of some of the state-level regulations and policies, such as the Phase 2 heavy-duty truck greenhouse gas standards proposed to be implemented within the transportation sector, the Project would not impede the state in implementing the policies.

With regard to operation, the Project is in line with the goals of the Natural and Working Lands focus area. As described in the Scoping Plan, natural lands, including wetlands, provide a multitude of economic and environmental benefits and therefore these lands should be managed in ways that maximize carbon benefits and ensure landscape resilience. The Scoping Plan further indicates that the restoration and improved management practices of natural lands should be a priority. The marsh restoration components of this Project are consistent with supporting the State's priorities regarding the management and restoration of natural lands.

The Project would not conflict or impede the state from implementing the broad policy and regulatory initiatives, and would comply with carbon sequestration goals, therefore, no impact would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No Impact.

3.7.6 Cumulative Impacts

Impact GG-C-1: Result in a cumulatively considerable contribution to a significant cumulative impact relative to greenhouse gas emissions.

GHG emissions, by their nature, represent a cumulative impact. No single project could generate enough GHG emissions to noticeably change the global average temperature. Instead, GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. Therefore, the Project analysis presented above also represents the cumulative analysis for impacts from GHG emissions. The Project analysis above found that impacts to GHG emissions would be less than cumulatively considerable.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No Impact.

3.7.7 References

Borgnis, Evyan, M.S. and Gerwein, Joel, Ph.D., 2014, Eel River Delta Ecosystem Restoration Project – Carbon Sequestration Analysis.

California Air Resources Board (CARB), 2012, *Status of Scoping Plan Recommended Measures*, accessed website at: http://www.arb.ca.gov/cc/scopingplan/status_of_scoping_plan_measures.pdf.

CARB, 2014, *First Update to the Climate Change Scoping Plan: Building on the Framework*, May.

CARB, 2015, *California Greenhouse Gas Emission Inventory - 2015 Edition*, accessed website at: http://www.arb.ca.gov/cc/inventory/data/data.htm.

North Coast Unified Air Quality Management District (NCUAQMD), 2016, Personal Communication: Jason Davis, Permitting & Planning Manager, July 13.

U.S. Environmental Protection Agency (EPA), 2016, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2014*, April 15.

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3.8 Hazards and Hazardous Materials

This section evaluates the potential impacts related to hazards and hazardous materials during construction and operation of the Project. This section is based in part on information from the Phase I Environmental Site Assessment (ESA) (Shelton Douthit Consulting LLC 2008) and Phase II soil and water contamination investigation (SounPacific Environmental Services 2008) prepared for the EREP portion of the Project; and the Environmental Data Resources, Inc. (EDR) report also prepared for the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential hazard and hazardous material impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels.

3.8.1 Setting

Site Description

Phase I ESA

A Phase I Environmental Site Assessment (Phase I ESA), dated May 16, 2008, was performed by Shelton Douthit Consulting on behalf of TWC for the EREP portion of the Project site. The Phase I ESA included reviews of government records, topographic maps, aerial photographs, a preliminary title report; interviews with the landowner, the lessee, a local official; and a site visit. The site inspection was conducted over two days on April 30 and May 1, 2008 by foot and by vehicle.

The purpose of the government records search was to assess the potential presence of contamination from hazardous substances or petroleum products on the EREP within standard search distances as defined by the American Society for Testing and Materials (ASTM). Due to the size of the property, an area wide EDR database query was conducted with a search distance extending approximately one mile beyond the EREP boundary, which includes the Russ properties parcels. Federal, state, tribal, and some local regulatory agency databases and institutional and engineering controls were searched by Environmental Data Resources, Inc. (EDR) an independent database search service.

Results of the records search indicated that the Project site is not listed among any of the government records examined. There are no institutional or engineering controls in connection with the Project site.

There are 15 Orphan Sites listed in the EDR report. Orphan Sites are excluded from the records search analysis because the exact address of the site is not reported. Using the limited information provided, the Phase I ESA determined that eight of the Orphan Sites are located several miles north or northeast of Ferndale.

Historical Use of the Project Site

Historical use information on the Project site was determined using aerial photographs, U.S. Geological Survey (USGS) topographic maps, a title report, zoning records, the 2007 appraisal report, a California Association of Realtors "Seller Vacant Land Questionnaire," and aerial photos at the Humboldt County Department of Public Works in Eureka. Aerial photographs from 1958, 1960, 1970, 1981, and 1988 were reviewed and indicated that the site has remained largely undeveloped open ranch land. All of the structures currently on the Project site are evident in all of the aerials with the exception of the dairy barn, which appears only in the 1958 and 1960 photographs. The roads are evident and in their current alignments.

Historical Use of Adjacent Property

Historical land use on adjoining properties was determined using the aerial photographs described above. Since 1958, properties to the north and east have been used for agriculture, largely farming and ranching. These properties remain in agricultural use today and only a handful of structures (such as barns and farm houses) are visible east of the Project site. Land to the west is undeveloped beachfront. There is no evidence in the aerial photographs of industrial, manufacturing or large-scale residential use of any kind on the adjoining or surrounding land.

Recognized Environmental Conditions

Based on the information collected for the Phase I ESA, there was evidence of known and suspected recognized environmental conditions (RECs) in connection with the EREP portion of the Project site. Known RECs include ammunition debris at the duck ponds and petroleum staining at the aboveground storage tanks (ASTs) and within the Potato Shed. Suspected RECs include leakage at the underground storage tank (UST), soil contamination at the burned dump in the silo foundation and at the dip tank, and contamination in dredge material along Russ Creek. Soil nitrate levels and water contamination of the well closest to the underground storage tank is also a concern.

The Phase I ESA identified six areas of concern requiring further investigation, which included ammunition debris at the duck blinds, petroleum staining at the ASTs, potential leakage at a former UST location, contamination at the burned dump at the silo, dredge material along Russ Creek, and in the subsurface surrounding a sheep dip tank.

As part of the Phase II ESA soil borings were hand augered to a maximum depth of nine feet and sampled around the dip tank, the AST, and the former UST. Surface soil samples (upper six inches) were collected from the silo burn area, the dip tank area, the Russ Creek area, and in a random pattern near the Duck Blind area.

From this investigation, three areas were identified with impact, the soil and groundwater directly below the AST's, soil boring B-8 located near the Sheep Dip Tank where elevated concentrations of copper and sulfate ion were found and within the surface soil sample that was collected on top of the concrete pad and within the bermed silo (sample S-2) where elevated levels of lead and zinc are indicated. Surface and subsurface soil samples collected near the UST, the Russ Creek area, and the Duck Blind area did not reveal the presence of any widespread impact by past activities at the site at locations sampled.

Definition of Hazardous Materials

A material is considered hazardous if it appears on a list of hazardous materials prepared by a federal, state, or local agency, or if it has characteristics defined as hazardous by such an agency. Factors that influence the health effects of exposure to hazardous materials include the dose to which the person is exposed, the frequency of exposure, the exposure pathway, and individual susceptibility.

The CCR defines a hazardous material as a substance that, because of physical or chemical properties, quantity, concentration, or other characteristics, may either: (1) cause an increase in mortality or an increase in serious, irreversible, or incapacitating illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of, or otherwise managed (CCR, Title 22, Division 4.5, Chapter 10, Article 2, Section 66260.10). Hazardous materials are classified according to four properties: toxicity, ignitability, corrosivity, and reactivity (CCR, Title 22, Chapter 11, Article 3), which are defined in the CCR, Title 22, Sections 66261.20-66261.24.

Potential Receptors/Exposure

The sensitivity of potential receptors in the areas of known or potential hazardous materials contamination is dependent on several factors, the primary factor being an individual's potential pathway for exposure. Exposure pathways include external exposure, inhalation, and ingestion of tainted air, water, or food. The magnitude, frequency, and duration of human exposure can cause a variety of health affects ranging from short-term acute symptoms or long term chronic effects. The principle elements of exposure assessments typically include:

- Evaluation of the fate and transport processes for hazardous materials at a given site
- Identification of potential exposure pathways
- Identification of potential exposure scenarios
- Calculation of representative chemical concentrations
- Estimation of potential chemical uptake.

Schools and residences are examples of sensitive receptors that could be susceptible to significant effects from exposure to hazardous materials. There are no schools within 0.25 mile of the Project site. The closest school to the Project site is Ferndale High School which is approximately 2.8 miles east from the southeast corner of the EREP entrance near the Potato Barn. The closest significant residential area is the City of Ferndale. There are a few rural residential homes within one mile of the Project site to the east.

Fire Hazards

There are 43 fire departments providing fire protection to cities and unincorporated communities in Humboldt County including: one County Service Area; eight Community Service Districts; 16 Fire Protection Districts, one Resort Improvement District, two city fire departments, and 14 fire companies in unincorporated towns not associated with local government agencies (Humboldt County 2012). The Project site is within the Ferndale Fire Protection District. In responding to emergencies, local fire departments work closely with law enforcement, public utilities, the County Office of Emergency Services, and ambulance companies. CAL FIRE identifies fire hazard severity zones in Local Responsibility Areas (LRA) throughout California. The Project site is primarily designated LRA Unzoned with two smaller areas designated LRA Moderate, and a very small area in the southwest corner of the Project site, near Shaw Creek, is designated LRA High (CAL FIRE 2007).

Airports

The closest public airport to the Project site is the Rohnerville Airport south of Fortuna, approximately 10 aerial miles east of the Project site. The second closest airport to the Project site is Samoa Field, located approximately 12 aerial miles northeast of the Project site on the Samoa Peninsula. There are no private airfields in the Project vicinity.

3.8.2 Regulatory Framework

Hazardous materials and hazardous wastes are subject to numerous federal, state, and local laws and regulations intended to protect public health and safety and the environment. The U.S. Environmental Protection Agency (U.S. EPA), U.S. Department of Transportation (DOT), California Environmental Protection Agency (Cal/EPA), and Department of Toxic Substances Control (DTSC) are the primary agencies that enforce these regulations. The main focus of the federal Occupational Safety and Health Administration (Fed/OSHA) and California Occupational Safety and Health Administration (Cal/OSHA) are to prevent work-related injuries and illnesses, including

those from exposures to hazardous materials. CAL FIRE implements fire safety regulations. In accordance with Chapter 6.11 of the California Health and Safety Code (CHSC, Section 25404, et seq.), local regulatory agencies enforce many federal and state regulatory programs through the Certified Unified Program Agency (CUPA) program, including:

- State Uniform Fire Code requirements (Section 80.103 of the Uniform Fire Code as adopted by the State Fire Marshal pursuant to Health and Safety Code Section 13143.9);
- Underground storage tanks (Chapter 6.7 of the Health and Safety Code, Sections 25280 et seq.).

The CUPA for Humboldt County is the Humboldt County Division of Environmental Health.

Federal

The primary federal agencies with responsibility for hazardous materials management include the US EPA, Fed/OSHA, and the DOT. Federal laws, regulations, and responsible agencies relevant to the Project are summarized in Table 3.8-1.

State and local agencies often have either parallel or more stringent regulations than federal agencies. In most cases, state law mirrors or overlaps federal law and enforcement of these laws is the responsibility of the state or of a local agency to which enforcement powers are delegated. For these reasons, the requirements of the law and its enforcement are discussed under either the state or local regulatory section.

State

Soil and Groundwater Contamination

The cleanup of sites contaminated by releases of hazardous substances is regulated primarily by the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), which was amended by the Superfund Amendment and Reauthorization Act of 1986 (SARA), the Brownfields Amendments (2002) and by similar state laws. Under CERCLA, the EPA has authority to seek the parties responsible for releasing hazardous substances and to ensure their cooperation in site remediation. CERCLA provides a defense to CERCLA liability, for those persons who could demonstrate, among other requirements, that they ‘‘did not know and had no reason to know’’ prior to purchasing a property that any hazardous substance that is the subject of a release or threatened release was disposed of on, in, or at the property. Such persons, to demonstrate that they had ‘‘no reason to know’’ must have undertaken, prior to, or on the date of acquisition of the property, ‘‘all appropriate inquiries’’ (AAI) into the previous ownership and uses of the property consistent with good commercial or customary standards and practices.

Section 30232 (Oil and hazardous substance spills) of the California Coastal Act provides for the protection against the spillage of crude oil, gas, petroleum products, or hazardous substances in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

Table 3.8-1 Federal Laws and Regulations Related to Hazardous Materials Management

Classification	Law or Responsible Federal Agency	Description
Hazardous Materials Management and Soil and Groundwater Contamination	Community Right-to-Know Act of 1986 (also known as Title III of the Superfund Amendments and Reauthorization Act (SARA)	Imposes requirements to ensure that hazardous materials are properly handled, used, stored, and disposed of and to prevent or mitigate injury to human health or the environment in the event that such materials are accidentally released.
	Comprehensive Environmental Response, Compensation and Liability Act of 1980 (amended by SARA 1986 and Brownfields Amendments 2002)	Regulates the cleanup of sites contaminated by releases of hazardous substances.
Hazardous Materials Transportation and Handling	U.S. Department of Transportation	Has the regulatory responsibility for the safe transportation of hazardous materials. The DOT regulations govern all means of transportation except packages shipped by mail (49 CFR).
Occupational Safety	Occupational Safety and Health Act of 1970	Fed/OSHA sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries (29 CFR).

The state's Hazardous Waste and Substances Sites List (Cortese List, Government Code Section 65962.5) identifies sites with leaking underground fuel tanks, hazardous waste facilities subject to corrective actions, solid waste disposal facilities from which there is a known migration of hazardous waste, and other sites where environmental releases have occurred. Before a local agency accepts an application as complete for any development project, the applicant must certify whether or not the project site is in the Cortese List. Databases that provide information regarding the facilities or sites identified as meeting Cortese List requirements are managed by the DTSC and State Water Resources Control Board (SWRCB). At sites where contamination is suspected or known to have occurred, the site owner is required to perform a site investigation and conduct site remediation, if necessary. There are two clean-up standards; one for residential and the other for commercial/industrial land uses. Standards are set for soil, groundwater, soil gas, and vapor intrusion of contaminants into buildings.

Hazardous Materials Transportation

The State of California has adopted DOT regulations for the intrastate movement of hazardous materials. State regulations are contained in Title 26 of the CCR. In addition, the State of California

regulates the transportation of hazardous waste originating in the state and passing through the state. Both regulatory programs apply in California. The two state agencies that have primary responsibility for enforcing federal and state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and Caltrans.

Occupational Safety

Worker health and safety is regulated at the federal level by the U.S. Department of Labor, Fed/OSHA. Under this jurisdiction, workers at hazardous waste sites (or workers coming into contact with hazardous wastes that might be encountered during excavation of contaminated soils) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations. Worker health and safety in California is regulated by Cal/OSHA. California standards for workers dealing with hazardous materials (including hazardous wastes) are contained in CCR Title 8. DTSC and the State Department of Occupational Health and Safety are the agencies that are responsible for overseeing that appropriate measures are taken to protect workers from exposure to potential soil or groundwater contaminants. At sites known or suspected to have soil or groundwater contamination, a site health and safety plan must be prepared and generally require approval by the CUPA. The health and safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at a contaminated site.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government, and private agencies. Responding to hazardous materials incidents is a part of this plan. The plan is administered by the State Office of Emergency Services (OES), which coordinates the responses of other agencies such as local fire and police agencies, emergency medical providers, CHP, the CDFW, and Caltrans.

Humboldt County has an adopted Humboldt County Operational Area Hazard Mitigation Plan as identified below. FEMA approved the Humboldt Operational Area Hazard Mitigation Plan on March 20, 2014.

Risk of Fires

The California Public Resources Code (PRC) sets forth fire safety regulations that include the following:

- Earthmoving and portable equipment with internal combustion engines must be equipped with a spark arrestor to reduce the potential for igniting a wildland fire (PRC Section 4442).
- Appropriate fire suppression equipment must be maintained during the highest fire danger period – from April 1 to December 1 (PRC Section 4428).
- On days when a burning permit is required, flammable materials must be removed to a distance of 10 feet from any equipment that could produce a spark, fire, or flame, and the construction contractor would maintain the appropriate fire suppression equipment (PRC Section 4427).
- On days when a burning permit is required, portable tools powered by gasoline-fueled internal combustion engines must not be used within 25 feet of any flammable materials (PRC Section 4431).

Water Quality

The Porter Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. Under the Act, the SWRCB has the ultimate authority over State water rights and

water quality policy. The nine RWQCBs regulate water quality under this Act through the regulatory standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region.

The five-member SWRCB allocates water rights, adjudicates water right disputes, develops state-wide water protection plans, establishes water quality standards, and guides the nine RWQCBs located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters. The SWRCB is responsible for implementing the Clean Water Act, issues NPDES permits to cities and counties through RWQCBs, and implements and enforces the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order No. 2009-0009, as amended by Order No. 2010-0014). Order No. 2009- 0009 took effect on July 1, 2010 and was amended on February 14, 2011. The Order applies to construction sites that include one or more acre of soil disturbance. Construction activities include clearing, grading, grubbing, excavation, stockpiling, and reconstruction of existing facilities involving removal or replacement.

Regional and Local

Humboldt County Operational Area Hazard Mitigation Plan

The 2014 Humboldt County Operational Area Hazard Mitigation Plan is the county's plan to identify and reduce hazards before any type of hazard event occurs. It aims to reduce losses from future disasters such as dam failure, drought, earthquake, fish losses, flooding, landslide, severe weather, tsunami, and wildfire. The plan also includes a vulnerability analysis and identifying mitigation initiatives and implementation.

Humboldt County Emergency Operations Plan

The Humboldt County Emergency Operations Plan (EOP) addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Humboldt County. The plan also addresses integration and coordination with other governmental levels when required. The EOP accomplishes the following:

- Establishes the emergency management organization required to mitigate any significant emergency or disaster affecting Humboldt County.
- Identifies the policies, responsibilities, and procedures required to protect the health and safety of Humboldt County communities, public and private property, and the environmental effects of natural and technological emergencies and disasters.
- Establishes the operational concepts and procedures associated with field response to emergencies, County Emergency Operations Center (EOC) activities, and the recovery process.

Humboldt County General Plan Goals and Policies

The following policies from the *Humboldt County General Plan* and *Eel River Area Plan* most relevant to the proposed Project are as follows:

Humboldt County General Plan

3291 Policies

1. *General. B. Development within the coastal zone shall minimize risks to life and property in areas of high geologic, flood and fire hazard, assure stability and structural*

integrity and neither create nor contribute significantly to erosion, geologic instability or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs

Eel River Area Plan

3.28 Hazards

A Development Policies

30253 New Development Shall:

1. *Minimize risks to life and property in areas of high geologic, flood and fire hazard.*
2. *Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding areas or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.*
3. *Tsunamis--New development below the level of the 100 year tsunami run-up elevation described In Tsunami Predictions tor the West Coast of the Continental United States (Technical Report H-78-26 by the Corps of Engineers) shall be limited to public access, boating, and public recreation facilities.*

3.8.3 Evaluation Criteria and Significance Thresholds

Based on Appendix G of the CEQA Guidelines, a hazards or hazardous materials impact is considered significant if implementation of the proposed Project would do any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- 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;
- Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- 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;
- 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;
- 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;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- 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.

Areas of No Project Impact

As explained below, construction and operation of the Project would not result in impacts related to several of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Would the Project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?** No schools are located within one-quarter mile of the Project site. The closest school to the Project site is Ferndale High School which is located approximately 2.8 miles east from the southeast corner of the EREP entrance. Therefore, the Project's effects on schools will not be evaluated further in this Draft EIR.
- **Would the Project 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?** The state's Hazardous Waste and Substances Sites List (Cortese List, Government Code Section 65962.5) identifies sites with leaking underground fuel tanks, hazardous waste facilities subject to corrective actions, solid waste disposal facilities from which there is a known migration of hazardous waste, and other sites where environmental releases have occurred. According to the Phase I ESA prepared for the EREP portion of the Project, results of the records search indicated that the Project site is not listed among any of the government records examined. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further in this Draft EIR.
- **Would the Project be 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, or would the Project result in a safety hazard for people residing or working in the Project area?** The proposed Project site is not located within an airport land use plan or within two miles of a public airport. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further in this Draft EIR.
- **Would the Project be located within the vicinity of a private airstrip, or would the Project result in a safety hazard for people residing or working in the Project area?** The proposed Project site is not located within the vicinity of a private airstrip. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further in this Draft EIR.
- **Would the Project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?** The proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The Project site is uninhabited and Project activities would not result in access issues to the Project site during and after construction. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further in this Draft EIR.

- **Would the Project 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?** The proposed Project does not include any structures for human occupancy. The Potato Barn includes a ranch office which is used during the day, but is not a residence. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further in this Draft EIR.

3.8.4 Methodology

This analysis considers the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from the proposed Project and identifies the primary ways that these hazardous materials could expose the environment or individuals to health and safety risks. Local and state agencies would be expected to continue to enforce applicable regulations to the extent that they currently do.

The following reports were used in the analysis of hazardous conditions at the Project site:

- *Draft Environmental Constraints Analysis* for the proposed Project (GHD 2014);
- Phase I and II ESAs;
- Available literature, including documents published by county, state and federal agencies;
- Applicable elements from the *Humboldt County General Plan* and *Eel River Area Plan*;
- Prior EIRs for the area (i.e., *Salt River Ecosystem Restoration Project*);
- California Coastal Act;
- *Geotechnical Report* (LACO 2016).

The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects, based on the significance thresholds in this section. In determining the level of significance, the analysis assumes that construction and operation of the Project would comply with federal, state, and local ordinances and regulations.

3.8.5 Impacts and Mitigation Measures

Impact HAZ-1: Would the Project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

The primary chemical hazard would be the use of ordinary equipment fuels and fluids during construction. In the unlikely event of a spill, fuels would be controlled and cleaned up in accordance with county and state regulations, with minimal environmental impact. Hazardous materials would not be routinely transported, stored, or disposed of onsite. The Project site is undeveloped, with the exception of a few barns, a Quonset Hut, scale house and associated corrals and pens, remnant foundations of two silos, and unpaved roads. Other improvements include six concrete watering troughs, three wells, wood-pole power with transformers, levees, metal gates, wood and t-post barbed wire fences, a concrete flood-control gate and sunken corrugated metal duck blinds. No hazardous sites are in the Project vicinity, and the contractor(s) would be required to comply with existing and future hazardous materials laws and regulations covering the transport, use, and disposal of hazardous materials), therefore, the impacts associated with the potential to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact HAZ-2: Would the Project 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.

Construction

There are two types of accidental releases that could occur during construction: 1) accidental spills; and 2) discovery of existing unknown contaminated soil or groundwater at the site. The Project site is undeveloped and does not appear on a list of hazardous materials sites. The Phase II study completed by SounPacific collected 51 soil samples during the investigation. No significant, widespread soil impact was detected. Lead and zinc levels were reported to be well below hazardous waste levels. SounPacific did identify Total Petroleum Hydrocarbons within a 10 foot radius of site B-1 (near the Potato Barn) above 100 parts per million (ppm). Local regulations generally require soil clean up where TPH concentrations exceed 100 ppm (SounPacific 2008). There are no Project activities planned at the Potato Barn, at the EREP entrance.

Accidental spills could occur during construction as hazardous materials would be used in varying amounts during construction of the proposed Project. Construction activities would use hazardous materials including but not limited to cleaning products; fuels (diesel and gasoline); lubricants and oils. Construction workers could be exposed to hazards and hazardous materials as a result of improper handling and storage.

CCR Titles 8 and 22 codify hazardous materials regulations, and their enabling legislation is set forth in Chapter 6.5 (Section 25100 et seq.) of the California Health and Safety Code. This legislation was established at the state level to ensure compliance with federal regulations to reduce the risk to the environment and human health from the routine use of hazardous substances. Construction specifications would include the following requirements in compliance with applicable regulations and codes, including, but not limited to CCR Titles 8 and 22, Uniform Fire Code, and Division 20 of the California Health and Safety Code: all reserve fuel supplies and hazardous materials must be stored within the confines of a designated construction area; equipment refuelling and maintenance must take place only within the staging area; and construction vehicles shall be inspected daily for leaks. These regulations and codes must be implemented, as appropriate, and are monitored by the state and/or local jurisdictions, including the Ferndale Fire Protection District.

Contractors would be required to comply with Cal/EPA's Unified Program; regulated activities would be managed by Humboldt County Division of Environmental Health, the designated CUPA for Humboldt County, in accordance with the regulations included in the unified Program. Such compliance would reduce the potential for accidental release of hazardous materials during construction of the proposed Project. As a result, it would lessen the risk of exposure of construction workers to accidental release of hazardous materials, as well as the demand for incident emergency response. The impact from potential release of hazardous materials would be less than significant.

Operation

Operational activities would include restoration of habitats, improved drainage, expansion of the tidal prism in the Inner Marsh, enhancement of freshwater ponds, suppression of invasive species and long-term maintenance activities including vegetation maintenance, infrastructure

maintenance, and sediment removal and management. As with construction, operational activities are required to be consistent with federal, state, and local laws and regulations addressing hazardous materials management and environmental protection, including, but not limited to 49 CFR 173 and 177, and CCR Title 26, Division 6 for transportation of hazardous materials, and CCR Titles 8 and 22, Uniform Fire Code, and Division 20 of the California Health and Safety Code for routine use of hazardous materials. These regulations and codes must be implemented, as appropriate, and are monitored by the state and/or local jurisdictions, including Caltrans, the Humboldt County Division of Environmental Health, and Ferndale Fire Protection District.

As a result, construction and operation of the proposed Project would not create a significant hazard to the environment or general public involving the release of hazardous materials into the environment. Therefore, this impact, for both construction and operation, is considered less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.8.6 Cumulative Impacts

Impact HAZ-C-1: Would the Project, in combination with other cumulative projects, increase exposure of hazardous substances to the public or environment.

The proposed Project is not anticipated to result in any potentially significant impacts. Such impacts would be localized in extent, and therefore would not contribute to hazardous materials impacts. All construction activities, as well as all new development, would be subject to compliance with existing and future hazardous materials regulations. Future development would be required to evaluate their respective hazards and hazardous materials impacts on a project-by-project basis. Compliance with all federal, state, and local regulations during the construction and operation of new developments would ensure that there are no cumulatively considerable significant hazards to the public or the environment associated with the routine transportation, use, disposal or release of hazardous materials, thereby ensuring that a less than significant, cumulatively considerable, impact would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.8.7 References

CAL FIRE, 2007, *Humboldt County Draft Fire Hazard Severity Zones in LRA*, September 19.

Humboldt County, 2012, *Humboldt County General Plan Update Draft Environmental Impact Report*, April.

LACO, 2016, *Eel River Estuary Ecosystem Enhancement Project Geotechnical Report*, June.

Shelton Douthit Consulting LLC, 2008, *The Connick Ranch Property Portions of Sections 20, 29, 30 and 32, Township 3 North, Range 2 West, and Portions of Sections 5 and 6, Township 2 North, Range 2 West, M.D.B.M. Ferndale, Humboldt County, California*, prepared for the Wildlands Conservancy, May 16.

SounPacific Environmental Services, 2008, *Phase Investigation Report of Findings, The Connick Ranch/Occidental Ranch 12 Miles South of Eureka, California*, prepared for The Wildlands Conservancy, May 23.

3.9 Hydrology and Water Quality

This section evaluates the potential impacts related to hydrology and water quality during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the hydrological setting for the Project area, including regional and local surface water and groundwater characteristics. Descriptions in this section are based on reviews of published information, reports, and plans regarding regional and local hydrology, climate, topography, and geology. The evaluation section establishes the thresholds of significance, evaluates potential hydrology and water quality impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce potential impacts to a less-than-significant level.

3.9.1 Setting

The following section discusses the hydrology and water quality-related context in which the proposed Project would be constructed and would operate, a description of the Project area and drainage to/from the Project area; regional climate and hydrology; beneficial uses of surface waters; surface water quality; drainage and flooding; and local groundwater basin and beneficial uses. The setting focuses on the 1850 acre Project area described in Section 1.1.

Regional Climate

The Project area is characterized by cool, foggy summers and cool, rainy winters. Due to the proximity to the Pacific Ocean, the Project area has very mild weather throughout the year. Most of the rainfall occurs from October to April. Fog and low overcast clouds are common within the area, especially during the evening and early morning hours. The intense maritime effect of the Pacific Ocean causes uniquely cool summers for the area. Based on climate data for Eureka (1981-2010; NOAA 2016), December is the coldest month, with an average maximum temperature of 55 °F (12.8 °C) and an average minimum temperature of 41 °F (4.8 °C). The warmest month of the year is August, which has an average maximum temperature of 64 °F (17.9 °C) and an average minimum temperature of 53 °F (11.6 °C).

Precipitation in the lower Eel River basin is strongly seasonal and is primarily associated with cyclonic frontal systems that sweep over northern California from the Pacific Ocean. The majority of precipitation falls during the period between October and April. Although rainfall is generally uncommon between May and September, coastal fog and low clouds prevail throughout the summer due to the onshore movement of moist air masses over cold water off the coast. The National Weather Service station at Scotia, CA reports a mean annual precipitation of 48.5 inches. Rainfall totals in the higher elevation areas of the Wildcat Hills can be considerably greater due to orographic (uplift of air mass as it passes over hills and mountains) effects.

Streamflow characteristics of the Lower Eel River basin reflect the regional climate. Tributary streams respond quickly to precipitation in the surrounding hills as surface runoff enters the channels from the steep hillslope areas. High flows are limited to the wet season between October and April. Baseflow conditions prevail throughout the dry season. Flow in the Eel River, Salt River and Wildcat Tributaries is perennial. Restricted drainage of Project and adjacent lands due to backwater effects of prolonged high flows on the Eel River has triggered routine flooding of the lowland areas in recent decades.

Site Hydrology and Drainage

The Project area lies within a large multi-parcel, leveed-off area. The area is segregated from the Pacific Ocean by a long, linear dune field and separated from the Eel and Salt Rivers by constructed levees lying north of the Inner Marsh and bordering Mill and Smith Creeks (see Figure 3.9-1). To the south, the site is bordered by the Wildcat Hills. Shaw and Russ Creeks are the main tributaries entering the study area from the Wildcat Hills. Because of the high sediment loads originating from the marine mudstones that dominate the Wildcat Hills, there are large and extensive alluvial fans that build out onto the south side of the Eel River delta plain. These are prominent features associated with active and historic alignments of Russ and Shaw Creeks (Figure 3.9-1).

Historically, the Project area was relatively flat with freshwater inflows from the Wildcat Hills flowing northward through a system of historic slough channels. The 1916 USGS topographic map of the Project area (Figure 3.9-2) indicates a long and continuous back-dune wetland system, dominated by the bifurcating Centerville slough channel, which extended from Centerville Beach to the Salt River. By 1945, much of the delta plain between the Eel River and Wildcat Hills had been converted to pasture through the construction of levees and ditches. Other notable changes through the present include (see Figure 3.9-1): filling of northern portion of Centerville Slough within the L.D. O'Rourke Foundation property (ORF) between and south of the current junction with Cut-Off Slough and extending to the Salt River; progressive construction of the current levee system inboard of Mill and Smith Creeks; installation of internal drainage ditches, most notably the Western Drainage Ditch that parallels the dunes and Pacific Ocean between Centerville Beach and Cut-Off Slough; and repeated realignment and construction of the primary northern levee and large tide gate structure that provides the primary outfall of drainage from the entire Project area. Human manipulation of the alignment of Russ Creek over this time has also created an alluvial ridge through the south central part of the Project area, creating a drainage divide between Angels Camp and the northern Project area (see Figure 3.9-1).

There has been a systematic destruction of the southern dune fields from overwash since 1998. By 2012, over 4,000-linear feet of foredune located north of Centerville Beach was lowered/levelled due to wave over-wash. Since 2012, a second foredune breach has become more established further north, adjacent to the confluence of Russ Creek and the Western Drainage ditch (Figure 3.9-1). The area behind the larger southern degraded dune, locally referred to as Angels Camp, is seasonally flooded by overwash from the Ocean.

Currently, tributary flow moves onto and through the Project vicinity via the elevated alluvial fan channels of Russ and Shaw Creek or the Creamery ditch on the Russ and TWC properties. These flows generally travel northward until they intersect or are directed to the Western or Eastern Drainage Ditches (Figure 3.9-1). These ditches also flow northward into the remnant Centerville Slough channel and then Cut-Off Slough. Water then exits the Project area through the Cut-Off Slough tide gates, ultimately discharging to the Salt River located further to the northeast. Some of the lowest-lying terrain occurs on lands owned by ORF, located east of the TWC property. This area, bordered by Mill and Smith Creeks, is drained by a system of remnant slough channels equipped with culverts and tide gates, with runoff directed northwestward into Cut-Off Slough opposite the Inner Marsh.

There are four Wildcat Hill tributary watersheds that contribute freshwater inflow to the Project area (see Figure 3.9-3). The total drainage area for all tributary watersheds is 5.88 square miles (mi2) and includes the following watersheds: Russ Creek (3.63 mi^2); Creamery Ditch (0.16 mi^2); Shaw Creek (1.19 mi^2), and tributaries draining to Angels Camp and the head of the Western Drainage

Ditch (0.93 mi^2). Although the County and EPA have been monitoring suspended sediment concentrations on Russ Creek since late 2013, only water level data is available for this gauge. However, the County has been monitoring flow and suspended sediment concentrations on Francis Creek in Ferndale since 2008. Francis Creek also drains the Wildcat Hills a short distance to the east and the watershed displays the same geology, slope and hydrologic characteristics as the Project tributaries. A unit area conversion is used on the Francis Creek flow data to estimate inflows from the Project tributaries (Appendix F).

Tidal Exchange

Historically, the Project area was tidal wetland, hosting a network of estuarine sloughs and an important component of the Eel River Estuary. A mixed semidiurnal tidal cycle exchanges ocean water through the Eel River mouth with the estuary twice daily. As part of Project feasibility studies, Kamman Hydrology and Engineering, Inc., the USFWS and TWC have completed periodic water level monitoring throughout the tidally influenced zones of the lower Eel/Salt River estuary and Cut-Off Slough watersheds since the summer of 2005 (see Appendix F). KHE completed a tidal reckoning analysis using the measured water levels and correlation to NOAA's Crescent City gauge. Calculated tidal datums representative of the Eel River estuary (referenced to the NAVD88 vertical datum) are presented in Table 3.9-1 below. For comparison, reported tidal datums for Humboldt Bay (South Spit) are also reported, referenced to the NAVD88 vertical datum.

Table 3.9-1 Computed Tidal Datums for Eel River Estuary

	Humboldt Bay, North Spit NOAA Stn. ID: 9418767 Datum Elevation (ft NAVD88)	Eel-Salt R. Estuary Computed Tidal Datum Elevation (ft NAVD88)
MHHW	6.53	6.52
MHW	5.82	5.83
MTL	3.37	3.73
MLW	0.93	1.64
MLLW	-0.33	0.98

Site Water Quality

Surface and ground water quality measurements for salinity and temperature have been collected across the Project area at 31 different locations since August 20, 2014 by TWC staff. Monitoring results are summarized below. A complete presentation of monitoring methods and results is provided in Appendix F.

Salinity

Water quality in site drainages is controlled by the mixing of a variety of source waters, including: 1) seasonally varied amounts of rainfall and freshwater inflow from the Wildcat tributaries having salinity less than one part per thousand (ppt); 2) shallow unconfined groundwater displaying relatively constant salinity concentrations, which vary spatially from brackish to marine[1] across the site; 3) freshwater inflow from the three artesian wells; and 4) leakage from the Cut-Off slough tide gates that displays seasonal salinities that are generally fresh in winter and marine in summer. Except for the Eastern Drainage, salinities across the site display seasonal variability – fresh to

[1] For purposes of this report, marine salinity refers to salinities that range from 25- to 32-ppt in concentration. Hypersaline salinities are those greater than 32-ppt and reflect the concentration of salts in stagnant waters due to evaporation.

brackish concentrations vary spatially and temporally through the winter, but return to near marine conditions throughout the summer. Freshwater runoff from artesian wells maintains perennial freshwater conditions in the southern half of the Eastern Drainage.

In general, the shallow groundwater table beneath the site occurs at an elevation of 2.5-feet NAVD88. This depth to water is very shallow, especially in low-lying areas. There appears to be a strong E-W summer salinity concentration gradient within the shallow groundwater, with salinity ranging from 24- to 25-ppt immediately behind the dunes decreasing to around 10- to 15-ppt at the center of the site, to 5-ppt at the far east side of the central portion of the site. Seasonally, shallow groundwater salinity immediately behind the dunes only decreases to around 20-ppt, but can drop to between 1- and 5-ppt at the other more eastern wells during the wet winter period. The high salinities near the dunes are attributable to seepage of ocean water eastward through the dunes. There is also some residual salinity locked into the fine-grained site soils that leaches salts into the shallow groundwater. The seasonal fluctuations in shallow groundwater salinity concentrations reflect winter freshwater recharge to the shallow groundwater. Because many internal ditches and remnant slough channels are deeper than the shallow water table, groundwater discharges into the channels and contributes to surface water salinity. The freshwater from the artesian wells (Figure 3.9-4) originates from a much deeper confined aquifer(s). Salinity concentrations from the artesian aquifer(s) is constant and does not vary seasonally as the aquifer(s) is too deep to be influenced by seasonal recharge at the site.

Along the western boundary of the site, summer salinity in the southern half of the Western Drainage ditch is marine due to a high percentage of ocean water seepage through the dunes. During the winter wet season, maximum salinity concentrations generally decrease to between 10- and 20-ppt in the downstream (northward) direction through the Western Drainage ditch into the middle portion of Cut-Off Slough. During the most extreme winter high flow periods, the salinities decrease to as low as 2-ppt throughout the interconnected Western/Centerville/Cut-Off Slough drainage, but salinities quickly rebound to intermediate concentrations during runoff recession and between storm events. Salinities can remain below 5-ppt for extended wet periods, however by summer they return to seasonal maximums between 30- and 32-ppt. Salinity concentrations throughout lower Cut-Off Slough and the Inner Marsh are very similar and display the same seasonal and storm-response patterns to those observed in the Western Drainage and Centerville Slough.

Runoff in the Eastern drainage ditch flows from south to north. The salinity within the southern portion of the Eastern drainage ditch is heavily influenced by runoff from Russ Creek and discharge from a freshwater artesian well located at the upper end of the ditch. As a result, waters in the southern half of the ditch display freshwater salinity throughout the year. The exchange of higher salinity waters with Centerville Slough at the north end of the Eastern drainage leads to increased salinity concentrations through the northern half of the ditch, especially during the summer months or prolonged dry periods.

Temperature

Surface water temperatures display a seasonal trend of warmest during July and August and coolest temperatures occurring in early January. The temperature of freshwater inflow from Russ Creek generally ranges between 10- and 20-degrees Celsius (C) or 50- to 68-degrees Fahrenheit (F) although temperatures as low as 5-degrees C° (41° F) were recorded in early January 2016. Temperature ranges on other surface waters within the Project area follow a similar trend except summer peak temperatures can approach over 25° C (77°) within the Inner Marsh and Cut-Off Slough at the north end of the Project area.

Water temperatures in the shallow unconfined groundwater display less seasonal variability than surface waters with temperatures generally ranging from 12°C (54°F) in winter and up to 17°C (63°F) in summer although temperatures as low as 8°C (46°F) were recorded in early January 2016. The water temperature in the deeper confined aquifer remained constant at 13°C (55°F) over the monitoring period.

Climate Change and Sea Level Rise

Warming atmospheric and ocean temperatures are leading to rising sea levels. A review of water level records maintained by NOAA at the Humboldt Bay North Spit tide gauge reveals an estimated recent eustatic sea level rise rate of 3.68 mm/yr (see Figure 3.9-5). There have been a number of local Sea Level Rise (SLR) studies completed, most notably the Coastal Regional Sediment Management Plan (Moffatt & Nichol 2013) and studies completed as part of Humboldt Bay Sea Level Rise Adaption Planning (HBSLRAP) project (NHE 2015 and Laird 2015). The NHE (2015) study presents estimates for SLR based on, "*The combined effects of global sea level rise, regional sea level height variability from seasonal to multidecadal ocean atmosphere circulation dynamics (e.g. El Niño Southern Oscillation), and relatively large tectonic vertical land motions associated with the Cascadia subduction zone (CSZ)."* In summary, NHE (2015) found that Humboldt Bay has the highest local sea level rise rate in California, approximately two to three times higher than the long-term global rate. The higher relative sea level rise rate observed in Humboldt Bay is reportedly due to high rates of local land subsidence (termed *"Vertical Land Motion"*) working in tandem with rising eustatic sea levels. For example, they calculate a relative sea level rise rate for North Spit of 4.61 mm/yr, which results from a regional mean sea level rise rate of 2.28 mm/yr and subsiding vertical land motion rate of -2.33 mm/yr. As a result, NHE concludes that, *"Global rise in sea levels will affect Humboldt Bay faster than other parts of U.S. west coast; and within the bay the southern end will be affected sooner than the northern portions of the bay."* Moffatt & Nichol (2013) cite NOAA's local sea level rise rate of 4.7+/1.5 mm/yr, which is very similar to the NHE rate reported above.

A reasonable planning horizon for the Eel River Estuary and Centerville Slough Enhancement Project is 50 years. Based on sea-level rise estimate of 4.61 mm/yr presented by NHE (2015), sea level is predicted to rise by 0.75-feet 50 years after the Project is constructed.

Beneficial Uses of Surface Waters

The current 2011 Basin Plan prepared by the North Coast Regional Water Quality Control Board (NCRWQCB) identifies the beneficial uses of surface waters and groundwater within its region (NCRWQCB 2011). The Basin Plan assigns beneficial uses by Hydrologic Areas and Sub Areas. The Project is located within the Eel River Hydrologic Area (111.00), which includes the following existing beneficial uses: Municipal and Domestic Supply; Agricultural Supply; Industrial Service Supply; Groundwater Recharge; Hydropower Generation; Freshwater Replenishment; Navigation; Water Contact Recreation; Non-Contact Water Recreation; Commercial and Sport Fishing; Cold Freshwater Habitat; Wildlife Habitat; Rare, Threatened, or Endangered Species; Marine Habitat (Estuaries); Migration of Aquatic Organisms; Spawning, Reproduction, and/or Early Development; Shellfish Harvesting; Estuarine Habitat; and Native American Culture. The beneficial uses provide the basis for determining appropriate water quality objectives for the region (NCRWQCB, p. 2-9 2011).

Surface Water Quality

In accordance with Section 303(d) of the Federal Clean Water Act, state governments must present the U.S. Environmental Protection Agency (U.S. EPA) with a list of “impaired water bodies,” defined as those water bodies that do not meet water quality standards, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology. The current 2010 Clean Water Act Section 303(d) list assigns impaired water bodies by Hydrologic Areas and Sub Areas. The Project is located within the Lower Eel River Hydrologic area, which is listed as impaired for sediment and water temperature (USEPA 2007).

Placement of a water body on the Section 303(d) list acts as the trigger for developing a Total Maximum Daily Load (TMDL), which is a pollution control plan for each water body and associated pollutant/stressor on the list. The TMDL identifies the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards.

A TMDL for sediment and temperature in the Lower Eel River was adopted by the United States Environmental Protection Agency (USEPA) on December 18, 2007. The TMDL includes numeric targets, source analysis, and sediment loading rates within the watershed (USEPA 2007).

Drainage and Flooding

Flood hazards within the Project area are related to both overbank flows from the Eel River and storm runoff from the Wildcat tributaries. Floodwaters from both the Eel River and Wildcat tributaries periodically overtop the channel banks and spill over the gently sloping lands within the Project area. Both sources carry large volumes of sediment contributing to delta and alluvial fan building, maintaining delta elevations in the face of sea level rise and tectonic subsidence. Overbank flooding from the Eel River begins at a stage of 19-feet at Fernbridge, with overbank floods occurring on the average of every six years (USDA 1993). The flood magnitudes of 1861/62, 1955 and 1964 events were all in excess of a 100-year recurrence flood, inundating the entire Project area and depositing significant volumes of sediment, particularly along the lower Salt River (5- to 6-feet of sediment, personal communication Bruce Slocum 2010; USDA 1993).

A 100-year flood on the lower Eel River would inundate the entire river delta and Project area including the perimeter levee system that defines the Project study area (area of shaded relief on Figure 3.9-1). However, flooding within the Project area occurs on a more frequent basis due to the existing perimeter levee and backwater effects associated with the Cut-Off Slough tide gate. During Eel River flood events having a 1-year or greater recurrence interval, the elevated river and estuary levels restrict drainage from the site through the Cut-Off slough tide gates. This creates a backwater effect that prevents runoff entering the Project area form the Wildcat tributaries from draining to the Eel River (Image 3.9-1).

Image 3.9-1 Eel River Estuary Inundation, Winter 2016 (Image Provided by B. Finney).

Therefore, the magnitude and duration of site flooding is controlled more commonly by the duration of Eel River high water than the magnitude of Eel River or Wildcat tributary flow. Therefore, hydrologic and hydraulic analyses of the Project focused more on the high frequency and relatively low magnitude flood flows than the 100-year event.

The Federal Emergency Management Agency (FEMA) delineates regional flooding hazards as part of the National Flood Insurance Program. According to local Flood Insurance Rate Maps, the majority of the Project area is located within a 100-year floodplain (FEMA 1999 and 2015) (see Figure 3.9-6). All Wildcat Hill tributary channels occur within the flood zone within the Project area. None of the Project area is mapped within the Eel River Floodway. Floodways are the portion of the stream that carries peak runoff. Floodways cannot be filled or developed without causing increased flooding in other parts of the watershed.

In addition to natural flood hazards, flooding can occur as a result of inundation caused by failure of a dam, a result of seiches (i.e., earthquake-induced oscillating waves in an enclosed water body), tsunamis (i.e., earthquake-induced waves formed in the open ocean that reach a shoreline), or mudflows. The Project area is not located near isolated bodies of water that would be subject to inundation by seiche. The topography of the Project area is generally flat and no areas that are likely to produce mudflows have been mapped or are present (Humboldt County 2001).

However, the Project area is located within a coastal area subject to inundation from tsunami. Much of the Project area lies inside the County's tsunami wave run-up boundary (see Figure 3.9-7). Only those areas consisting of higher elevation alluvial fans formed by Russ Creek and Centerville Road corridor are outside of this zone.

Local Groundwater Basin and Beneficial Uses

The Project area is located within the Eel River Valley Groundwater Basin (Basin 1-10; CDWR, 2004). The Eel River Valley Groundwater Basin is one of the largest groundwater basins in Humboldt County. The area includes the lower eight miles of the Van Duzen River Valley and the Eel River Valley. The groundwater system within the basin provides numerous benefits to the region, including rural residential and municipal water supplies, irrigation water for agriculture, and baseflow to streams and surface water bodies. The California Department of Water Resources has identified the Eel River Valley Basin as a medium priority basin under the recently adopted Sustainable Groundwater Management Act (SGMA). Under SGMA, local entities are required to develop groundwater sustainability plans for high- and medium-priority basins. Humboldt County is assisting in the formation of a local groundwater sustainability agency (GSA) to oversee development of a plan to manage groundwater resources in a sustainable fashion in the Eel River Valley Basin. Primary objectives of the GSA management plan are to avoid undesirable impacts from groundwater development.

Locally, the basin includes the Eel River delta and channel gravels, floodplain clays and silts, and older terrace gravels of the Eel River (Everson 1959). Shallow groundwater is present within the alluvial deposits underlying much of the Eel River delta. Eel River delta plain alluvium is of recent age and is composed of gravel, sand, silt and clay. In addition, it includes the clay, mud, and silt underlying the estuary tidal marshes. It underlies most of the irrigated agricultural land and is the most productive deposit in the area, yielding water to wells in large amounts.

The principal groundwater body of the Eel River valley is unconfined and occurs in the coarse sand and gravel of the alluvium and river-channel deposits along and north of the Salt River (Figure 3.9-4). The highly permeable coarse-grained alluvial deposits are tapped by numerous irrigation wells (Ibid). Between the Eel and Salt Rivers, coarse alluvial deposits of sand and gravel are continuous from the surface to depths of 60 feet or more. In the vicinity of Ferndale, south of the Salt River, and east from the Ocean to the Coffee Creek, the alluvium contains none of the coarse material typical of large river deposits; instead it contains fine deposits derived from the adjacent hillsides (Ibid) and is mapped as “fine grained alluvium” (see Figure 3.9-4). Wells in this area encounter a considerable thickness of fine-grained deposits.

According to Don Laffranchi of Northcoast Pumphouse (personal communication December 26, 2010), irrigation wells constructed immediately north of the Salt River area are screened at depths from 40- to 60-feet bgs, while wells installed immediately south of the Salt River are screened around a depth of 80-feet bgs. The finer grained alluvium found south of the Salt River have lower permeability and are tapped by wells predominantly along the mouths and alluvial fans of the streams draining the Wildcat Hills.

Beneath the shallow alluvium underlying the Project area, are partly to fully confined aquifers in the Carlotta formation. In the vicinity of Ferndale, where the coarse gravel in the alluvium is absent, there are at least two aquifers in the Carlotta formation. In the early 1950’s, wells tapping these aquifers ranged from 180- to more than 340-feet and displayed artesian conditions (flowing water out of well heads)(Ibid). There are at least three artesian wells located within the Project area designated as “Artesian” wells on Figure 3.9-4. The deep flowing wells tap confined aquifers that are distinctly separate from the shallow groundwater system. Based on the artesian conditions and fresh water quality, recharge to the confined aquifers occurs from river and rainfall further up-valley, well outside of tidal influence, as well as contributions of recharge and underflow along the sides of the river valley where the confined aquifer formation slopes up to the ground surface (Ibid).

The current 2011 Basin Plan prepared by the NCRWQCB identifies the beneficial uses of groundwater within its region. The Basin Plan assigns the following existing beneficial uses for groundwater: Municipal and Domestic Supply; Agricultural Supply; Industrial Service Supply; Industrial Process Supply; and Native American Culture (NCRWQCB 2011).

Water Use

Groundwater pumping for irrigation accounts for almost all of the water use in the Project area. Groundwater is pumped seasonally for irrigation within the Project area during the months of June through September. Table 3.9-2 and 3.9-3 show groundwater irrigation usage at EREP and Russ Ranch & Timber, respectively, by month for the year 2014. Irrigation usage and groundwater withdrawals (water use) would not change under Project conditions.

Table 3.9-2 Irrigation at EREP in 2014

Month	Irrigation (gpm)	Acres*	Hours of Irrigation/Day	Gallons / Day	Gallons / Month
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	200	18	10	120,000	3,600,000
July	200	18	10	120,000	3,720,000
August	200	18	10	120,000	3,720,000
September	200	18	10	120,000	3,600,000
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0

Source: The Wildlands Conservancy, 2014.
*A total of 18 acres was irrigated in 2014 in the Quonset Hut pasture.

Table 3.9-3 Irrigation at Russ Ranch & Timber in 2014

Month	Irrigation (gpm)	Acres*	Hours of Irrigation/Day	Gallons / Day	Gallons / Month
January	0	0	0	0	0
February	0	0	0	0	0
March	0	0	0	0	0
April	0	0	0	0	0
May	0	0	0	0	0
June	1,200	220	12	864,000	25,920,000
July	1,200	220	12	864,000	26,784,000
August	1,200	220	12	864,000	26,784,000
September	1,200	220	12	864,000	25,920,000
October	0	0	0	0	0
November	0	0	0	0	0
December	0	0	0	0	0

3.9.2 Regulatory Framework

Federal

Clean Water Act

The federal Clean Water Act (CWA), enacted by Congress in 1972 and amended several times since, is the primary federal law regulating water quality in the United States and forms the basis for several state and local laws throughout the country. The CWA established the basic structure for regulating discharges of pollutants into the waters of the United States. The CWA gave the U.S. EPA the authority to implement federal pollution control programs, such as setting water quality standards for contaminants in surface water, establishing wastewater and effluent discharge limits for various industry categories, and imposing requirements for controlling nonpoint source pollution. At the federal level, the CWA is administered by the U.S. EPA and U.S. Army Corps of Engineers (USACE). At the state and regional levels in California, the act is administered in part and enforced by the SWRCB and the nine RWQCBs.

Section 303(d) of the Federal Clean Water Act requires state governments to present the U.S. EPA with a list of "impaired water bodies," defined as those water bodies that do not meet water quality standards, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology.

The Lower Eel River Total Maximum Daily Loads for sediment and temperature have been established, under Section 303(d) of the Clean Water Act, because the State of California has determined that the water quality standards are not met due to excessive sediment and temperature.

In accordance with Section 303(d), the State of California periodically identifies "*those waters within its boundaries for which the effluent limitations ... are not stringent enough to implement any water quality standard applicable to such waters.*" In 1992, EPA added the Lower Eel River to California's 303(d) impaired waters list due to elevated sedimentation/ siltation and temperature, as part of listing the entire Eel River basin. The North Coast RWQCB has continued to identify the Lower Eel River as impaired in subsequent listing cycles, the latest in 2006. The primary purpose of the Total Maximum Daily Loads for the Lower Eel River is to assure that beneficial uses of fresh water habitat (such as salmonid habitat) are protected from elevated levels of sediment and temperature. The TMDLs set the maximum levels of pollutants that the water body can receive without exceeding water quality standards for the Lower Eel River basin.

Sections 404 and 401 of the CWA require permitting and state certification for construction and/or other work conducted in "waters of the United States." Such work includes levee work, dredging, filling, grading, or any other temporary or permanent modification of wetlands, streams, or other water bodies. The Project would require both a RWQCB 401 Water Quality Certification and USACE Section 404 permit.

National Flood Insurance Program

FEMA administers the National Flood Insurance Program (NFIP) to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA also issues Flood Insurance Rate Maps identifying which land areas are subject to flooding. The maps provide flood information and identify flood hazard zones in each community. The design standard for flood protection is established by FEMA, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedance probability (i.e. the 100-year flood event). The EREP is entirely within the 100-year flood zone.

National Pollutant Discharge Elimination System

The National Pollutant Discharge Elimination System (NPDES) permit program was established in the CWA to regulate industrial and municipal discharges to surface waters of the United States. NPDES permit regulations have been established for broad categories of discharges including point source municipal waste discharges and nonpoint source stormwater runoff.

A NPDES permit is required when proposing to, or discharging of waste into any surface water of the state. For discharges to surface waters, these requirements become a federal NPDES Permit from the RWQCB in the Project area.

Federal Antidegradation Policy

The federal antidegradation policy set forth in 40 CFR §131.12. SWRCB Order No. 68-16 incorporates the federal antidegradation policy into the state policy for water quality control and ensures consistency with federal CWA requirements. This federal regulation establishes a three-part test for determining when increases in pollutant loadings or other adverse changes in surface water quality may be permitted:

e) Existing instream water use and level of water quality necessary to protect the existing uses shall be maintained and protected.

f) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the state finds after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation or lower water quality, the state shall assure water quality adequate to protect existing uses fully. Further, the state shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.

g) Where high quality waters constitute an outstanding National resource, such as waters of National and State Parks and wildlife refuges and waters of exceptional recreational or ecological significance, water quality shall be maintained and protected.

The federal anti-degradation policy serves as a catch-all water quality standard to be applied where other water quality standards are not specific enough for a particular waterbody or where other water quality standards do not address a particular pollutant.

National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. The Act is notable for safeguarding the special character of these rivers, while also recognizing the potential for their appropriate use and development. It encourages river management that crosses political boundaries and promotes public participation in developing goals for river protection. Each river is administered by either a federal or state agency. Regardless of classification, each river in the National System is administered with the goal of protecting and enhancing the values that caused it to be designated.

The Eel River was designated a Wild and Scenic River on January 19, 1981 from the mouth of the river to 100 yards below Van Arsdale Dam. The primary agencies managing the river under the Wild and Scenic Rivers Act include the California Resources Agency, Bureau of Land

Management, Six Rivers National Forest, Mendocino National Forest, and Round Valley Reservation.

State

Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act is the primary statute covering the quality of waters in California. Under the Act, the SWRCB has the ultimate authority over state water rights and water quality policy. The nine RWQCBs regulate water quality under this Act through the regulatory standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region.

The five-member SWRCB allocates water rights, adjudicates water right disputes, develops state-wide water protection plans, establishes water quality standards, and guides the nine RWQCBs located in the major watersheds of the state. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters. The SWRCB is responsible for implementing the Clean Water Act, issues NPDES permits to cities and counties through RWQCBs, and implements and enforces the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order No. 2009-0009, as amended by Order No. 2010-0014). Order No. 2009-0009 took effect on July 1, 2010 and was amended on February 14, 2011. The Order applies to construction sites that include one or more acre of soil disturbance. Construction activities include clearing, grading, grubbing, excavation, stockpiling, and reconstruction of existing facilities involving removal or replacement.

Fish and Game Code Section 1602

The CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. To meet this responsibility, the Fish and Game Code (Section 1602) requires an entity to notify CDFW of any proposed activity that may substantially modify a river, stream, or lake. The CDFW requires a Stream Alteration Agreement (SAA; 1603 Permit) for projects that would divert or obstruct the natural flow of water, change the bed, channel or bank of any stream, or use any material from a streambed. The SAA is a contract between the applicant and the CDFW stating what can be done in the riparian zone and stream course. The department is interested in any work undertaken in or near a river, stream, or lake that flows at least intermittently through a bed or channel. This permit is required for any work that occurs in, on, over or under a waterway, from the bed of a stream to the top of the bank, any work that would divert or obstruct the natural flow of water, change the bed, channel, or bank of any stream, or use any material from the streambed. This permit is also required when removing exotic vegetation from a riparian area.

If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a SAA would be prepared. The Agreement includes reasonable conditions necessary to protect those resources and must comply with the CEQA. The entity may proceed with the activity in accordance with the final Agreement.

Regional and Local

Regional Water Quality Control Board

Regional Water Boards adopt and implement Water Quality Control Plans (Basin Plans) which recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems. The current 2011 Basin Plan prepared by the NCRWQCB provides a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region.

The NCRWQCBs' planning process also includes water quality planning programs (adoption, review, and amendment of state-wide and basin water quality control plans and policies), including development and adoption of total maximum daily loads (TMDLs) and implementation plans; regulatory programs (permitting and control of discharges to water through "NPDES" and WDR permits, discharge to land – "Chapter 15," and stormwater and storage tanks programs); monitoring and quality assurance programs; nonpoint source management programs, including the "Watershed Management Initiative;" and funding assistance programs, including grants and loans.

North Coast RWQCB Basin Plan

As set forth in the Basin Plan, specific beneficial uses of surface water and groundwater have been established for the Hydrologic Area in which the Project is located (see Section 3.9.1, Setting). To protect these beneficial uses, the Basin Plan sets forth the following water-resource protection objectives for inland surface waters:

Color: Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

Tastes and Odors: Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses. Numeric water quality objectives with regards to taste and odor thresholds have been developed by the State Department of Health Services and the U.S. EPA. These numeric objectives, as well as those available in the technical literature, are incorporated into waste discharge requirements and cleanup and abatement orders as appropriate.

Floating Material: Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

Suspended Material: Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Settleable Material: Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

Oil and Grease: Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

Biostimulatory Substances: Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

Sediment: The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity: Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

Conductance: The conductance shall conform to a 90 percent upper limit of 375 micromhos at 77F and a 50 percent upper limit of 225 micromhos at 77F9.

Total Dissolved Solids (TDS): The TDS shall conform to a 90 percent upper limit of 275 mg/L and a 50 percent upper limit of 140 mg/L.

pH: The pH shall conform to those limits listed in the basin plan. The pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses.

Dissolved Oxygen: Dissolved oxygen concentrations shall conform to a 90 percent lower limit of 7.5 mg/L and a 50 percent lower limit of 10.0 mg/L.

Bacteria: The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following:

- In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml (State Department of Health Services).
- At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43/100 ml for a 5-tube decimal dilution test or 49/100 ml when a three-tube decimal dilution test is used (National Shellfish Sanitation Program, Manual of Operation).

Temperature: Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" including any revisions thereto. In addition, the following temperature objectives apply to surface waters:

- The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
- At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.
- At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Toxicity: All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective would be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary for other control water that is consistent with the requirements for "experimental water" as described in Standard Methods for the Examination of Water and Wastewater, 18th Edition (1992). As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute bioassays of effluents would be prescribed. Where appropriate, additional numerical receiving water objectives for specific toxicants would be established as sufficient data become available, and source control of toxic substances would be encouraged.

Pesticides: No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life.

Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64444.5.

Chemical Constituents: Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Division 4, Article 4, Section 64435 and Section 64444.5, and listed in Table 3.9-2 of this Plan.

Waters designated for use as agricultural supply (ARG) shall not contain concentrations of chemical constituents in amounts which adversely affect such beneficial use.

Radioactivity: Radionuclides shall not be present in concentrations which are deleterious to human, plant, animal or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or indigenous aquatic life.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64443.

Tastes and Odors: Groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. Numeric water quality objectives have been developed by the State Department of Health Services and U.S. EPA. These numeric objectives, as well as those available in the technical literature, are incorporated into waste discharge requirements and cleanup and abatement orders as appropriate.

Bacteria: In groundwater's used for domestic or MUN, the median of the most probable number of coliform organisms over any 7-day period shall be less than 1.1 MPN/100 ml, less than 1 colony/100 ml, or absent (State Department of Health Services).

Radioactivity: Groundwater used for domestic or MUN shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 5, Section 64443, Table 4.

Chemical Constituents: Groundwater used for domestic or MUN shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64435 and Section 64444.5. Groundwater used for agricultural supply shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use.

North Coast RWQCB NPDES Permit

Projects that discharge stormwater runoff to waters of the U.S. from land disturbances greater than one acre require a General Construction Stormwater Discharge Permit from the RWQCB, as required under NPDES Order No. 2009-0009, as amended by Order No. 2010-0014. To obtain a permit, a discharger files a Notice of Intent to be included under the State's NPDES permit. General conditions of the permit require that dischargers must eliminate non-stormwater discharges to

stormwater systems, develop and implement a SWPPP, and perform inspections of stormwater pollution prevention measures.

California Coastal Act, Coastal Development Permit

The California Coastal Act of 1976 requires any person proposing to develop in the coastal zone to obtain a Coastal Development Permit. The coastal zone extends from the State's three-mile seaward limit to an average of approximately 1,000 yards inland from the mean high tide of the sea. In coastal estuaries, watersheds, wildlife habitats, and recreational areas, the coastal zone may extend as much as five miles inland. In developed urban areas, the coastal zone may extend inland less than 1,000 yards. As defined by the Coastal Act, "development" of land above, in or beneath water includes: the placement or erection of any solid material or structure; discharge or disposal of any dredge material or a gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining or extraction of any material; change in the density or intensity of use of land (including land diversions); construction, reconstruction, demolition, or alteration of the size of any structure; and the removal or harvesting of major vegetation other than for agricultural operations, kelp harvesting, and timber operations which are in accordance with a Timber Harvest Plan issued by the California Department of Forestry and Fire Protection.

Coastal Development Permit applications for projects in or near coastal streams and wetlands can often be obtained from a local Planning Department if the project is not within the primary jurisdiction of the Coastal Commission. Coastal Development Permits issued by local governments, for projects within 100 feet of a coastal stream and wetlands, can be appealed to the Coastal Commission.

Section 30233 of the California Coastal Act includes requirements for recognizing a project as for "restoration purposes" amongst other allowable uses and filling of wetlands. Under this policy, the project must establish or re-establish former habitat conditions, re-establish landscape-integrated ecological processes, improve habitat value and diversity, and be self-sustaining. Section 30236 of the Coastal Act provides for review of flood control projects. Under this policy it must be demonstrated that no other measure for protecting existing structures in the floodplain is feasible, and such protection is necessary for public safety or to protect existing development. The Project must also incorporate the "best mitigation measures feasible".

Humboldt County Code

Under Title III - Land Use and Development, Division 3 - Building Regulations, Section 331-12, of the Humboldt County Code, a grading permit is required from the County for any project requiring grading. The purpose of the permit is to safeguard life, limb, property and the public welfare, including the protection of water resources and their related habitats by regulating grading and related activities on private and public property, to control and reduce erosion, to reduce sediment delivered to drainages and streams, and to protect fishery habitat and other biological resources by providing best erosion control and sediment management practices. The County code covering grading permits sets forth rules and regulations to control excavation, grading and earthwork construction, including fills and embankments and erosion and sedimentation controls.

Grading in excess of 5,000 cubic yards (3825 m^3) shall be performed in accordance with the approved grading plan prepared by a civil engineer, and shall be designated as "engineered grading." Application for a grading permit shall be accompanied by two sets of plans and specifications, and supporting data consisting of a soils engineering report and engineering geology report. Grading plans must comply with County grading standards including erosion and sedimentation control.

Humboldt County General Plan Goals and Policies

The Humboldt County General Plan and Eel River Area Plan contain the following goals and policies that are relevant to hydrology and water quality for the Project:

Humboldt County General Plan

3360 Goal

1. *To maintain or enhance the quality of the county's water resources and the fish and wildlife habitat utilizing those resources.*
2. *To maintain a dependable water supply, sufficient to meet existing and future domestic, agricultural, industrial needs and to assure that new development is consistent with the limitations of the local water supply.*

2553 Policies

5. *All development should be designed to minimize erosion and sedimentation.*

3291 Policies

B. *Agricultural lands which are in flood plain areas shall be retained for use in agriculture.*

3361 Policies

2. *Regulate development that would pollute watershed areas.*
12. *Support the development of fisheries enhancement projects on small Humboldt County streams.*
13. *Ensure that projects located within state designated wild, scenic or recreational river basins are consistent with the guidelines in the State Wild and Scenic Rivers Act (as amended).*

4235 Drainage

2. *Natural drainage ways shall be utilized where possible to convey drainage flows consistent with streamside management policies in the General Plan.*
3. *Drainage facilities shall be capable of passing a 10 year intensity storm without static head at entrance and passing a 100 year intensity storm without major damage. (Res. 85-81, 8/20/85)*

Eel River Area Plan

3.41 C. Transitional Agricultural Wetlands Identification and Development Policies

2. *Allowable Uses in Transitional Agricultural Lands: Within transitional agricultural lands planned for Agriculture Exclusive, agriculture is the principal use in these areas but shall maintain long-term protection by ensuring new development is consistent with the provisions of this policy. Close cooperation among the County, Coastal Commission Agricultural Stabilization and Soil Conservation Service, Agricultural Extension, farm organizations, and fish and wildlife agencies will be necessary In order to ensure that new agricultural development will be permitted consistent with these objectives. Changing agricultural practices may require periodic review and modification of this policy.*

b *Diking and filling for new development in transitional agricultural lands shall be limited to oil and gas wells (consistent with Section 3.27 and 30607.1 of the Coastal Act), incidental public service purposes and to the principal uses in agricultural exclusive*

designation, including construction of spillways and modification or repair of existing dikes threatened by erosion.

c Dredging in transitional agricultural lands shall be limited to incidental public service purposes and to maintenance and repair of existing tide gates, floodgates, dikes, levees and other drainage works, including replacement of drainage works damaged by flood or tidal surges.

d. Road crossings of sloughs, channels and ditches shall be by culvert or bridge and all crossings may require a Stream Alteration Agreement with the California Department of Fish and Game.

e. Mitigation for these uses by restoration of tidal action or removal of till, except as provided in "b" above, is not feasible and shall not be required. Mitigation should where feasible take place in the Eel River Planning Area and where practicable, as close as possible to the development.

3.41 F. Eel River

30236. Channelizations, dams, or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method tor protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

a. Water Diversions

The Eel River is the principal coastal resource of this PIanning Area. The County finds that the diversion of water from the Eel River, either individually or cumulatively will have a significant adverse impact on coastal resources. Specifically, diversion of water out of the Eel River basin could result in detrimental changes to coastal resources including: fisheries (both marine and freshwater), riparian systems, wildlife, wetlands systems, agriculture, recreation opportunities, sediment transport in the channel, disposition of sediment on farmlands, and increase the potential for saltwater intrusion in coastal aquifers.

For these reasons:

(1) AII projects in and out of the Coastal Zone which may have a significant impact on instream flow regimes and coastal resources, shall overall, maintain in-basin beneficial uses of water, where feasible enhance instream beneficial uses of water, and prevent significant adverse effects to coastal resources.

(2) The County shall continue to pursue opportunities to restore and enhance, if possible, in-stream flows through such activities as participating in the re-licensing of the Potter Valley Dam.

(3) Any project not in conformance with these policies, in or out of the Coastal Zone, is inconsistent with this Local Coastal Plan and Section 30200 of the Coastal Act of 1976.

b. Eel River Fishery

The Department of Fish and Game, in consultation with the County, local sports and fishing clubs, and property owners adjacent to the Eel River, should investigate opportunities and implement measures to augment and enhance anadromous fish runs in the Eel River. This should include: channel improvements, revision of fishing season opening day to better

correlate to the fishery and hydrological conditions, and further study of harbor seal impacts on the fishery.

3.41 F. 2. Development and Uses Within the Eel River

New development within stream channels shall be permitted when there is no less environmentally damaging feasible alternative, where the best feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to:

a. Wetlands, fishery, and wildlife enhancement and restoration projects.

b. Road crossings, consistent with the provisions of Section 3.41F4c.

c. Maintenance dredging for flood control and drainage purposes consistent with the Transitional Agricultural Lands Policies and within areas planned for agriculture.

d. Maintenance of levees, roads, fences, dikes, drainage channels, flood gates and tide gates including replacement.

3.41 F.2. f.

(2) Bank protection shall be permitted to:

(a) Maintain necessary public or private roads.

(b) Protect principal structures in danger from erosion.

(c) Protect Iands designated Agriculture Exclusive from erosion.

(3) It is the policy of the County, based on the effectiveness of protection, costs, and habitat protection, to prefer:

(a) Piling fence to rock hard points.

(b) Rock hard points to continuous revetment.

(4) Bank protection projects, including design and materials shall minimize adverse effects on fisheries, wildlife, and recreation.

(a) Mitigation for rock hard points or continuous revetment shall include as a minimum:

(i) Where feasible, planting of riparian vegetation shall be included within the revetment itself.

(ii) Where feasible, planting and maintaining riparian vegetation within the riparian corridor.

(4) Bank protection projects require permits from the Department of Fish and Game and the Army Corps of Engineers.

3.41 G. Other Coastal Streams

30236. Channelizations, dams or other substantial alterations of rivers and streams shall incorporate the best mitigation measures feasible, and be limited to (1) necessary water supply projects, (2) flood control projects where no other method for protecting existing structures in the flood plain is feasible and where such protection is necessary for public safety or to protect existing development, or (3) developments where the primary function is the improvement of fish and wildlife habitat.

2. Within the Eel River Planning Area the following coastal streams (as mapped on USGS 7.5' Quads) have been identified:

Hawk Slough
Quill Slough
Hogpen Slough
Seven Mile Slough
Unnamed stream North of Loleta
Intermittent streams on Table Bluff
Morgan Slough
Smith Slough
Cutoff Slough
Centerville Slough
Russ Creek
Reas Creek
Salt River
Williams Creek
Coffee Creek
Perry Creek
Barber Creek

3. *New development within stream channels shall be permitted when there is no less environmentally damaging feasible alternative, where the best feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to:*

a. *Wetlands, fishery, and wildlife enhancement and restoration projects.*

b *Road crossings, consistent with the provisions at Section 3.41G6e.*

c. *Maintenance dredging for flood control and drainage purposes consistent with the Transitional Agricultural Lands Policies and within areas planned for agriculture.*

d. *Maintenance of levees, roads, fences, dikes, drainage channels, flood gates and tide gates including replacement.*

e. *Development consistent with 3.41G 6, below.*

f. *New fences, so long as it would not impede the natural drainage or would adversely affect the stream environment or wildlife. (Typically, 2-3 strands of barbed wire with fence posts set outside of the stream channel would be consistent with this policy)*

3.41 G.

7. *Mitigation measures for development with riparian corridors shall, at a minimum, include retaining snags within the riparian corridor unless felling is required by CAL-OSHA or permitted by California Department of Forestry forest and tire protection regulations, and retaining live trees with visible evidence of current use as nesting sites by hawks, owls, eagles, osprey, herons, or egrets. Replanting of disturbed areas with riparian vegetation (including such species as alders, cottonwoods, willows, Sitka spruce, etc.) has not been required unless natural regeneration does not occur within two years of completion of the development project.*

8. *The County shall request the Department of Fish and Game to review plans for development within riparian corridors, the Department may recommend measures to mitigate disruptions to habitats.*

9. *Natural drainage courses, including ephemeral streams, shall be retained and protected from development which would impede the natural drainage pattern or have a significant adverse effect on water quality or wildlife habitat. Stormwater outfalls, culverts, gutters,*

and the like, shall be dissipated, and, where feasible, screened. Natural vegetation within and immediately adjacent to the bankfull channel shall be maintained except for removal consistent with the provisions of this section.

3.9.3 Evaluation Criteria and Significance Thresholds

The Project and operations would cause a significant impact related to hydrology and water quality, as defined by the CEQA Guidelines (Appendix G), if it would:

- Violate any water quality standards or waste discharge requirements;
- 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 (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);
- 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;
- 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;
- 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;
- Otherwise substantially degrade water quality;
- 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;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- 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; or
- Inundation by seiche, tsunami, or mudflow.

Areas of No Project Impact

As explained below, construction and operation of the Project would not result in impacts related to one of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria is not discussed further in the impact analysis, for the following reasons:

- ***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***. The proposed Project does not include the construction of new housing or structures for human occupancy. Therefore, the significance criterion related to the placement of housing within a 100-year flood hazard zone is not applicable to the proposed Project and is not discussed further.

3.9.4 Methodology

Potential impacts to hydrology and surface water quality are evaluated for both construction and operational activities. The Project and operations are evaluated to determine compliance with applicable federal, State, and local permitting and design requirements related to storm water quality, flooding, and drainage. Potential impacts related to groundwater depletion are evaluated, including the potential for pumping of groundwater for excavation dewatering. Flooding impacts are evaluated by determining if the Project is located within a FEMA flood hazard area or other area of flooding, as well as assessing the Project's compliance with local storm water requirements. The evaluation also considers potential impacts to changes in inundation area, drainage rate and water quality during average annual and more extreme storm events less than the 100-year peak flow.

3.9.5 Impacts and Mitigation Measures

Impact HWQ-1: Violate any Water Quality Standards or Waste Discharge Requirements.

The Project is required to obtain and comply with necessary permits and comply with other Humboldt County and the NCRWQCB requirements, acting to prevent, or essentially reduce the potential for the Project and operations to violate any water quality standards or waste discharge requirements.

The greatest potential Project impacts to water quality would result from sediment mobilization during channel/wetland construction and operations. Construction and operation activities such as site clearing, grading, excavation, channel widening/deepening, material stockpiling, tide gate removal and installation, demolition, and berm construction could leave soils exposed to rain or surface water runoff that may carry soil contaminants (e.g., nutrients or other pollutants) into waterways adjacent to the site, degrade water quality, and potentially violate water quality standards for specific chemicals, dissolved oxygen, suspended sediment, or nutrients. This impact would be potentially significant.

SWRCB Order No. 2009-0009 applies to public and private construction projects that include one or more acres of soil disturbance. Because the proposed Project is anticipated to disturb over one (1) acre of land, compliance with Order No. 2009-0009 would be required. Therefore, if construction and operation activities associated with the Project are not properly managed, applicable water quality standards and waste discharge requirements could be violated. The impact is considered potentially significant.

Mitigation Measure HWQ-1a: Manage Construction Storm Water.

The Project and operations shall obtain coverage under State Water Resources Control Board Order No. 2009-0009-DWQ, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities, as amended by Order No. 2012-0006. In compliance with the NPDES requirements, a Notice of Intent (NOI) shall be prepared and submitted to the NCRWQCB, providing notification and intent to comply with the State of California General Permit. In addition, a Construction Storm Water Pollution Prevention Plan (SWPPP) would be prepared for pollution prevention and control prior to initiating site construction activities. The Construction SWPPP shall identify and specify the use of erosion sediment control BMPs for control of pollutants in stormwater runoff during construction related activities, and would be designed to address water erosion control, sediment control, off-site tracking control, wind erosion control, non-stormwater management control, and waste management and materials pollution control. A sampling and monitoring program shall be included in the Construction SWPPP that

meets the requirements of the NCRWQCB to ensure the BMPs are effective. A Qualified Storm Water Pollution Prevention Plan Practitioner shall oversee implementation of the Plan, including visual inspections, sampling and analysis, and ensuring overall compliance.

The operations associated with the adaptive management plan include but not limited to activities associated with sediment management and channel maintenance are not anticipated to require preparation and implementation of a SWPPP as per section I (C) of Order No. 2009-0009 DWQ which lists activities that are not covered under the general permit: (*24) Routine maintenance to maintain the original line and grade, hydraulic capacity, or original purpose of the facility and (25) Disturbance to land surfaces solely related to agricultural operations such as disking, harrowing, terracing and levelling and soil preparation*.

Mitigation Measure HWQ-1b: Implement Contractor Training for Protection of Water Quality.

All contractors that would be performing demolition, construction, grading, operations or other work that could cause increased water pollution conditions at the site (e.g., dispersal of soils) shall receive training regarding the environmental sensitivity of the site and need to minimize impacts. Contractors also shall be trained in implementation of stormwater BMPs for protection of water quality.

Mitigation Measure HWQ-1c: In- Stream Erosion and Water Quality Control Measures during Channel Excavation and Operations.

In instances where excavation occurs in an effort to widen/deepen Project channels and ditches, in-stream erosion and turbidity control measures shall be implemented. These measures include installation and maintenance of in-stream turbidity curtains, cofferdams and silt-fence along channel banks as specified in Project designs, specifications and erosion control plans.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measures HWQ-1a through -1c would mitigate potential impacts on water quality standards and waste discharge requirements to a less-than-significant level by complying with, and receiving coverage under, the NPDES General Permit for Discharge of Stormwater associated with construction and operational activities. The implementation of BMPs, consistent with the requirements of the site's NPDES General Permit for Discharge of Stormwater associated with Construction Activity and the SWPPP, would ensure that the Project and operations do not violate any water quality standards or waste discharge requirements. With implementation of Mitigation Measures HWQ-1a through -1c, the Projects construction and operational water quality impacts would be reduced to a less-than-significant level.

Impact HWQ-2: Substantially Deplete Groundwater Supplies or Interfere Substantially with Groundwater Recharge.

Excessive groundwater pumping has the potential to significantly impact the underlying aquifer and lower the local groundwater table. Some short-term lowering of the local shallow groundwater table may result from construction dewatering, but is not anticipated to be long lasting or detrimental to the surrounding environment. The Project and operations include the enhancement and expansion of an existing internal slough network. Most internal channels already intersect the shallow groundwater table, which is in close proximity to the ground surface. Because these channels already intersect the water table, it is not anticipated that the Project would substantially dewater the local shallow aquifers any more than already occurs.

The introduction of new groundwater pumping for irrigation purposes or changes to existing groundwater demands are not proposed under the Project plan. Groundwater demands and use for pasture irrigation are not intended to increase above existing levels.

The high salinity and low permeability of the shallow unconfined aquifer preclude its use for water supply. Recharge to the deeper confined aquifers that host the existing water supply wells occurs well outside of the Project area. Thus, the introduction of higher salinity waters in association with the Project would not affect recharge of the deeper confined aquifer that supplies the existing site wells. Therefore, impacts from groundwater pumping and Project effects on groundwater recharge would be less than significant.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-3: Substantially Alter the Existing Drainage Pattern of the Site or Area and Increasing Erosion or Siltation.

On-Site Erosion Potential

Apart from reducing sediment loads with construction and management of Sediment Management Areas, the Project and operations would not change the type and volume of constituents, delivered via the Project area to outer Cut-Off Slough, the Salt River or the Eel River estuary. The Project does propose the beneficial reuse of excavation material to recontour the floodplain in specific areas and for agronomic placement in upland areas located on the valley floor. All sediment reuse areas would be located within the FEMA flood zone and subject to potential localized remobilization during flood periods. However, as experienced during past flood events, the Project area is more typically a location of sediment deposition versus source to receiving waters, especially when surrounded by levees.

Sediment reuse areas are designed as agricultural uplands. Floods that inundate the sediment reuse areas would have been inundated under existing topography, therefore, apart from a possible reduction in flooding frequency and duration to other site areas, there is no adverse change in flood conditions in the sediment reuse areas. Sediment reuse on agricultural areas would consist of placing soil over the landscape, effectively raising the ground elevation. Given the low profile and rapid revegetation rate anticipated in the reuse areas, the potential Project impacts represent no change from existing conditions. Any beneficial reuse material scoured and/or replaced during localized flooding would constitute a small, if not insignificant volume of sediment transported and/or deposited within the Project area. It would also represent a natural geomorphic process that would occur regardless of material placement.

Considerable hydraulic analysis was completed to develop an optimal restoration design and operations for the Project area. The Project and operations would alter drainage patterns of the site, although internal slough channels would be located and sized to optimize internal marsh circulation and water quality. Through intensive hydraulic modeling and established hydraulic geometry relationships for local area reference sites, internal channel dimensions are designed to be in equilibrium with Project hydraulic conditions in order to minimize erosion, down-cutting and bank failure. Bioengineering methods would be used, as necessary, to stabilize sites of potential bank and berm erosion. Hard stabilization measures (e.g., rock slope protection) may also be incorporated, if necessary, to prohibit excessive erosion at notable energy transition points such as culverts, bridges and gates.

Apart from localized areas at new culverts, bridges and gates, the reintroduction of tidal exchange to the excavated Project channels would not impart enough change or energy to increase erosion in any portion of the newly designed or improved channels. The post-excavation geometry for Centerville Slough and lower Russ Creek channels are intended to accommodate the increased tidal prism created through increased tidal exchange. Therefore, no additional channel expansion is anticipated – any excess tidal or flood energy would simply maintain the construction channel geometry and any channel erosion is expected to occur at natural rates that should not greatly increase turbidity and can be accommodated by downstream receiving waters without adversely impacting aquatic ecology. Measures to protect new setback berms and existing levees from erosion would also be integrated into the stable Project design. Increases in potential erosion to on-site channels resulting from Project activities and operations is potentially significant.

Off-Site Erosion Potential

The Project and operations would result in a significant increase in tidal prism[2] exchange with lower Cut-Off Slough and the Salt River located north and downstream of existing tide gates. This results in higher flow rates through outer Cut-Off Slough channel accompanied by minor increases in flow velocity. Simulated Project velocities in lower Cut-Off Slough increase notably under Project conditions, with maximum values approaching 1.0 ft/s at both locations during ebb tides and -1.5 ft/s[3] during flood tides. On the lower Salt River between Cutoff and Jack Sloughs (see Figure 3.9-8), both daily ebb and flood peak project velocities increase by 0.5-ft/s over existing spring ebb tide velocities of 2.0 ft/s and existing spring peak flood velocities of -1.5 ft/s. Further downstream of Jack Slough, Salt River flow velocity increases diminish, with daily peak project flow velocities increasing between 0.1- and 0.2-ft/s during both ebb and flood tides. Under both pre- and post-Project conditions, flow velocities on the Salt River increase in a downstream direction with maximum ebb and flood velocities at or approaching 4.0- and -4.0-ft/s at the downstream-most location.

Simulated pre- and post-Project water levels in Cut-Off Slough are very similar and do not indicate any significant change. Simulated water levels on the lower Salt River only differ in that minimum levels are slightly higher (approximately 0.25-feet) under the 2015 NOP Equilibrium (Proposed Project) alternative than existing conditions

There is a positive correlation between the tidal prism flowing through a channel and the width and depth of the channel. Increases in tidal prism create greater flow rates and energy through associated tidal channels. This increase in energy erodes and maintains channel geometry to a state of equilibrium with the associated tidal prism volumes. Increases in tidal prism yield progressively larger channels. Just as the Salt River channel has decreased in width and depth with the elimination of tidal prism exchange due to historic land conversion by diking and draining of tidal wetlands, reintroducing potential tidal prism exchange associated with the Project and operations may result in the widening/deepening of channels downstream of the Project area.

The increase in post-Project tidal prism and flow energy through lower Cut-Off Slough and Salt River would increase the sediment transport capacity through downstream reaches. This change would enhance and better sustain a primary objective of enhanced sediment transport for the Salt River Ecosystem Restoration Project. Enhanced water and sediment flow through the downstream

[2] For purposes of this report, the term tidal prism refers to potential diurnal tidal prism, which is defined as the volume of water in a marsh system between Mean Higher High Water (MHHW) and Mean Lower Low Water (MLLW) tidal datums.

[3] A negative flow velocity indicates a flood tide while a positive velocity value indicates an ebb tide.

reaches would also better maintain the restoration efforts associated with the Eel River Estuary and Centerville Slough Enhancement Project.

Increased tidal prism and flow energy through the receiving reaches also has the potential to increase channel size. The increases and resulting magnitude of channel velocity and increased scour potential in lower Cut-Off Slough and Salt River is not large, but could lead to minor channel widening and/or deepening. This potential change would not be a long-term or chronic condition as any increase in channel geometry associated with increased tidal prism exchange would reach a stable and equilibrated condition. The overall time frame of evolution to equilibrium geometry is uncertain, but would initiate immediately upon construction of the Project and likely take no longer than a decade. Under tidal exchange, material mobilized and scoured from the lower Cut-Off Slough and Salt River channels would be transported to the Eel River estuary during short duration pulses that occur primarily during spring tidal events when the tidal prism and flow velocity is maximized, leading to short periods of highest channel scour potential. Very little change (channel evolution) can be expected during neap tidal periods, when velocities are below the limits of scour and transport.

As indicated above, historic land development in the lower Salt River watershed has significantly reduced tidal prism leading to sedimentation and reductions in channel size of lower Cut-Off Slough and Salt River. Any Project-related channel expansion would occur within and be restricted to the current/historic channel alignments. Project potential tidal prism would increase notably relative to existing conditions, however, nowhere close to the magnitude of historic (i.e., Full Tidal alternative) conditions that sustained a much larger channel width than would occur under Project conditions. Thus, given the strong correlation between channel geometry and tidal prism exchange, Project channel expansion and resulting equilibrium widths would remain smaller than historic conditions and not expand beyond the historic channel footprint. Given the small amounts of channel material that would be mobilized during future tidal periods, no discernible impacts associated with increased turbidity or sediment transport would occur to off-site locations over natural occurring and existing levels. Therefore, this impact would be less than significant

Mitigation Measure HWQ-3: Implement Erosion and Water Quality Monitoring, Maintenance and Adaptive Management Plan.

The long-term erosion monitoring of on-site channels would routinely screen the Project for areas experiencing excessive erosion leading to degraded water quality. Maintenance and adaptive management strategies are contained in the plan to stabilize areas experiencing excessive erosion.

Level of Significance: Less than significant with mitigations.

Impact HWQ-4: Substantially Alter Existing Drainage Pattern, or Substantially Increase Rate or Amount of Runoff in a Manner which would Result in Flooding On- or Off-site.

The Project proposes substantial changes to site drainage patterns and the way flood waters are routed through the Project area. However, the Project and operations do not include any elements that would change the flood magnitudes of source waters entering or originating on the site. The most notable changes in inundation and drainage patterns associated with the Project stems from the introduction of seasonally varied muted tidal exchange into the Project area. In winter, maximum tidal inflow elevation into the Inner Marsh would be restricted to approximately 2.5-feet, equal to current conditions. Maintaining this level would preserve the existing flood storage capacity of the Inner Marsh. During the summer dry season, when flooding is not a hazard, Project

operations would allow the maximum muted tide levels to rise to an elevation of approximately 5-feet, increasing the depth and area of aquatic habitat.

A detailed hydrodynamic modelling analysis has been performed by KHE for the Project, simulating pre- and post-Project hydrology, hydraulic and water quality conditions during both the winter and summer operational periods and can be found in Appendix F. As part of this analysis, KHE was able to develop, calibrate and validate an integrated hydrodynamic and advection-dispersion model that accurately simulates water levels, flow rates and salinity within the Project area during both the winter and summer water operation periods. Again, these operation periods differ only in the magnitude of muted tidal exchange as described above and in the Project Description.

The modelling results were used to identify potential Project impacts, which informed revisions to Project design and subsequent re-analysis to avoid identified potential impacts. Important Project elements and considerations during this analysis included: maintaining drainage from adjacent and off-site properties; quantifying changes in flood storage associated with channel creation/expansion; quantifying changes in flood storage associated with sediment reuse; determining conveyance capacity and regulation of flow through culverts; and routing and exchange between Project parcels within the Project area.

Comparing simulation results between existing and Project conditions for the winter operation period, shows that the Project would not increase peak winter storm runoff rates and volumes as a result of proposed Project changes. These results also indicate that the Project and operations would not increase or prolong the areas of inundation within on- or off-site properties during the winter.

During the summer, the Project water levels and inundated areas increase within targeted aquatic habitat enhancement areas (i.e., the Inner Marsh, new Centerville Slough channel corridor located west of the new internal berms and Angels Camp) over those experienced under Existing Conditions due to the increase in muted tidal exchange. However, analysis of the Project design indicates no increase in summer water levels or inundation periods would occur in other on- or off-site property areas, including the lands of Russ Ranch and Timber lying east of the new internal berms and O'Rourke Foundation. Therefore, impacts from the Project to on- and off-site flooding, during both summer and winter, would be less than significant.

The earthwork associated with the Project Alternative results in a net increase in available flood water storage above an elevation of 2.5-feet within the Project area. Any excavation below the 2.5-foot elevation datum does not yield increases in flood storage because these newly created depressions are assumed to fill with groundwater. Figure 3.9-9 plots stage-volume curves for the existing condition and 2015 NOP Equilibrium alternative above the 2.5-foot elevation. It is important to note that the stage-volume curve for the 2015 NOP Equilibrium alternative presented in Figure 3.9-9 was developed based on a Project grading plan that includes construction of the proposed internal berm features as described in the NOP Project Description. However, this curve does not include a full accounting of sediment reuse in that the balance of excavated material not used in internal berm construction is not captured in the curve. However, this curve would be used during final Project design to guide how much fill can be placed without reducing project flood storage below existing flood storage volumes at any given elevation. Therefore, this impact would be less than significant.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-5: Substantial Additional Sources of Polluted Runoff or Otherwise Substantially Degrade Water Quality.

Surface Water

The development of the proposed Project and operations and intended land use would alter the types, quantities, and timing of stormwater contaminates relative to existing conditions. If this stormwater runoff is uncontrolled and not treated, the water quality of the discharge could affect off-site drainage channels and downstream water bodies.

Construction activities could result in substantial stormwater discharges of suspended solids and other pollutants into local drainage channels from the Project area. Construction and operational related chemicals (e.g., fuels, paints, adhesives, etc.) could be washed into surface waters by stormwater runoff. The deposition of pollutants (e.g., gas, oil, etc.) onto the ground surface by construction equipment could similarly result in the transport of pollutants to surface waters by stormwater runoff or in seepage of such pollutants into groundwater.

The Project does not increase the amount of existing developed areas. Therefore, there would be no change in the type and concentration of stormwater discharge contaminants for developed areas from such factors as vehicle traffic, types of activities occurring on site, types of chemicals used on-site (e.g., pesticides, herbicides, cleaning agents, petroleum by-products), road surface pollutants, and rainfall intensity. No Project-induced impacts from increased livestock are anticipated. Fenced setbacks would be incorporated to keep cows out of creek channels. The added floodplain and wetland areas would also act to better filter potential runoff caring livestock waste and reduce existing impacts to the Salt and Eel Rivers.

The wetland enhancement and sediment management area components would not have a significant effect on the general water quality of existing wetlands and receiving river and estuary water quality (apart from sediment impacts addressed above). During the years following construction, revegetation of the Project area wetland would help stabilize earthen areas and decrease on-site erosion. Connector channels and internal slough channels would have stabilized having reached an equilibrated geometry. Construction and operation of the Sediment Management Areas would effectively reduce sediment loads to the downstream receiving rivers and estuary.

A current impact to water quality at the Project area is poor circulation within the existing drainage network and lack of tidal exchange with outer Cut-Off Slough. This has led to stagnant ponding and likely reduced dissolved oxygen concentrations. Project elements that increase an interconnected channel network and introduce tidal exchange would reduce these impacts and yield more desirable aquatic habitat conditions.

The Project enhancement design and operations would be completed in a responsible manner by experienced wetland restoration design experts. Through the final design process, the technical analysis and modeling tools would continue to be used to simulate wetland circulation and water quality conditions through the diverse seasonal and wet-dry climatic conditions experienced at the Project area. Through these analyses, an optimal design would be developed, further refining the Project grading plans and ensuring adequate water quality conditions for desired wetland habitat types. However, if large scale floods and sediment deposition, or other external processes alter wetland morphology and adversely impact circulation and quality, this impact may be significant to water quality. Therefore, this impact on surface water quality is potentially significant.

Groundwater

Based on soil borings and grain-size analyses completed by LACO in 2015, soil that hosts the shallow unconfined groundwater at the Project area consists of either: a) interbedded Eel River flood or over-bank deposits of fine sand, silt with sand, silt and clay; b) fat- and lean-clay and peat tidal marsh deposits; and c) clay and silt fill. Because of the dominance of fine-grained material, these shallow soils have low hydraulic conductivity values and do not provide high groundwater yields to wells. Sediment sampling also reveals soil of “saline-sodic” nature due to the presence of salts in soil. These salts and saline soils were deposited in a tidal marsh environment, exposed to tidal exchange of saline waters from the Eel River estuary and the Pacific Ocean. Therefore, reintroducing tidal exchange would not significantly alter the current character of shallow sediments, which host groundwater. It has also likely that salts from shallow sediments are leaching out and may be elevating site ditch water salinities.

The high salinity and low permeability of the shallow unconfined aquifer material preclude its use for water supply. Currently, seepage of ocean water with marine salinity through the dunes partially recharges the shallow groundwater. Hydrodynamic modelling of the proposed Project indicates that during the winter wet season, simulated Project surface water salinities across the site are significantly less than those simulated for existing conditions. During the summer period, average simulated Project salinity concentrations in the southern half of the Project area under tidal influence are equal to existing conditions, but salinity concentrations display a greater variability. In the northern half of the Project site under tidal influence, simulated Project surface water salinity concentrations are higher than existing conditions. (Appendix F). Recharge to the deeper confined aquifers that host the existing water supply wells occurs well outside of the Project area. Thus, the introduction of higher salinity waters in association with the Project would not impact recharge or water quality of the existing site irrigation wells and impacts to irrigation water quality would be less than significant. Changes in shallow groundwater levels are not expected to alter available groundwater storage capacity and available groundwater supply as the shallow groundwater beneath the Project Site is independent from the deeper aquifer that hosts the existing water supply wells.

Muted tidal exchange through the new Inner Marsh muted tide regulator (MTR) equipped culverts would be controlled seasonally. In winter, the maximum tidal inflow elevation into the Inner Marsh would be restricted to approximately 2.5-feet (NAVD 88), equal to current conditions. Maintaining this level of tidal exchange would preserve the existing shallow groundwater table elevations. During the dry season, when flooding is not a hazard, the MTR would be adjusted and operated to allow the maximum muted tide levels to rise to an elevation of approximately 5-feet (NAVD 88), increasing the depth and area of aquatic habitat. However, this would introduce increased recharge potential from the internal channels to the shallow groundwater system, seasonally raising the saturated water table elevation closer to the ground surface. This would bring brackish groundwater closer to or within the root-zone of a larger area of pasture lands than occurs currently, predominantly adjacent to the new Centerville and lower Russ Creek channels on the Eel River Estuary Preserve. As stated above, no increase in shallow groundwater salinity is anticipated in association with the Project as existing soil already contains high salinity levels and no significant increase in the salinity of Project surface waters that recharge the shallow groundwater would occur. Therefore, the impacts of the Project on shallow groundwater quality would be less than significant.

Mitigation Measures HWQ-1a through -1c and HWQ-3

As described above under HWQ-1a through -1c, the implementation of BMPs, consistent with the requirements of the site's NPDES General Permit for Discharge of Stormwater associated with construction and operational activities, would ensure that the Project does not violate any surface water quality standards. The long-term monitoring plan associated with Mitigation Measure HWQ-3 would routinely screen Project surface water quality and source areas leading to degraded water quality. Maintenance and adaptive management strategies shall be designed and implemented under the plan to modify the morphology of poor surface water quality source areas. With implementation of the Mitigation Measures HWQ-1a through -1c and HWQ-3, the Projects construction and operational water quality impacts would be reduced to a less-than-significant level.

Another component of the Monitoring, Maintenance and Adaptive Management Plan associated with Mitigation Measure HWQ-3 is the routine monitoring of pasture agricultural productivity. This would include assessing and ensuring current levels of agricultural productivity are maintained, if not improved. In the event monitoring identifies a net decrease in agricultural productivity due to elevated seasonal shallow groundwater table elevations, adaptive management actions would be taken, which may include reducing the amount of summer tidal exchange to reduce impacts.

Level of Significance: Less than significant with mitigation.

Impact HWQ-6: Place Structures within the 100-year Flood Hazard Area which Impede or Redirect Flood Flows.

The Project does not propose introducing habitable structures into the FEMA-defined flood zone or floodway. However, the Project does include constructing new internal berms, bridges and culverts that would alter the distribution and routing of ordinary high waters within the Project area. During all flood flow periods, the addition of new culverts connecting Inner Marsh to Cut-Off slough would increase the total conveyance capacity of drainage waters leaving the Project area. However, the backwater effects of Eel River high waters ultimately control the timing and rate of drainage. As discussed above, hydrodynamic modeling and design analyses indicate the Project would not increase the level or area of peak flooding above existing levels. Therefore, the impacts of the Project structures on impeding or adversely redirecting flood flows would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-7: Expose People or Structures to a Significant Risk Due to Flooding.

See Impact HWQ-6 above.

Impact HWQ-8: Place People or Structures in Areas Inundated by Tsunami.

Tsunamis are long period waves that are typically caused by underwater disturbances such as landslides, volcanic eruptions, or seismic events. Areas highly susceptible to tsunamis are low-lying coastal areas such as tidal flats, marshlands, and diked areas that are still at or near sea level. Most of the Project area lies inside the County's tsunami wave run-up boundary (see Figure 3.9-7).

Currently, the Project area would likely temporarily fill and pond tsunami flood waters that overtop the adjacent dunes and perimeter levees leading to inundation of the low-lying Project areas. The Project does not propose to place any habitable structures or people into the Project area. Livestock and agricultural practices within the Project area would continue per existing conditions. Physical structures such as the low-relief internal berms and new culverts would likely be insulated from direct wave or overwash energy as compared to the dunes and levee, which would experience and absorb more of the tsunami flood wave impact. Thus, apart from being

fully inundated with ocean water and possible secondary impacts such as debris and sediment accumulation, the proposed Project structures would likely be insulated from tsunami damage. In summary, the Project structures and operations would not exacerbate or enhance tsunami impacts over existing conditions. Nor would the Project inhibit evacuation routes in the event of tsunami warning. Therefore, the impacts of the Project and structures on tsunami dangers would be less than significant.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

3.9.6 Cumulative Impacts

Impact HWQ-C1: Project Result in a Cumulatively Considerable Contribution to Cumulative Impacts Related to Hydrology and Water Quality.

Cumulative Projects identified in Table 3.0-1 would have the potential to affect water quality and increased runoff during construction and long-term operation. The Projects would continue to contribute stormwater flows to the local and regional drainage facilities, but not at levels higher than already experienced. Construction activities associated with cumulative Projects would be subject to existing federal, state, and local regulations. Existing county policies for Project design and approval, as well as NCRWQCB regulations, would minimize potential impacts to a less-than-significant level.

Another potential cumulative impact from implementation of local area projects is the increase in tidal prism exchanged through the Salt River channel. Several of the projects including the Salt River Ecosystem Restoration Project and Smith Creek Wetland Restoration Projects (Grinsell and Walker Properties) would, in combination with the Eel River Estuary and Centerville Slough Enhancement Project, increase the volume of tidal storage and exchange through the mutually shared receiving Salt River channel that connects each Project area to the Eel River estuary. The Ocean Ranch project on the north side of the Eel River would also contribute to possible changes in tidal and sediment exchange through the Eel River estuary.

Designs for the Salt River and Eel River Estuary and Centerville Slough Enhancement Projects increase internal and Salt River channel dimensions to accommodate the increase in tidal prism exchange. As detailed in the discussion of off-site erosion potential under Impact HWQ-3, the potential erosion associated with increased cumulative project tidal prism would not increase the rate of sediment delivery to the Eel River Estuary above natural conditions and any associated channel expansion would occur well within the footprint of historic channel alignment. Implementation of the Project plus the cumulative Projects would not result in significant cumulative impacts on hydrology and water quality. Therefore, cumulative impacts would be less-than-significant with respective mitigations.

Mitigation Measures: No Mitigation is necessary.

Level of Significance: Less than significant.

3.9.7 References

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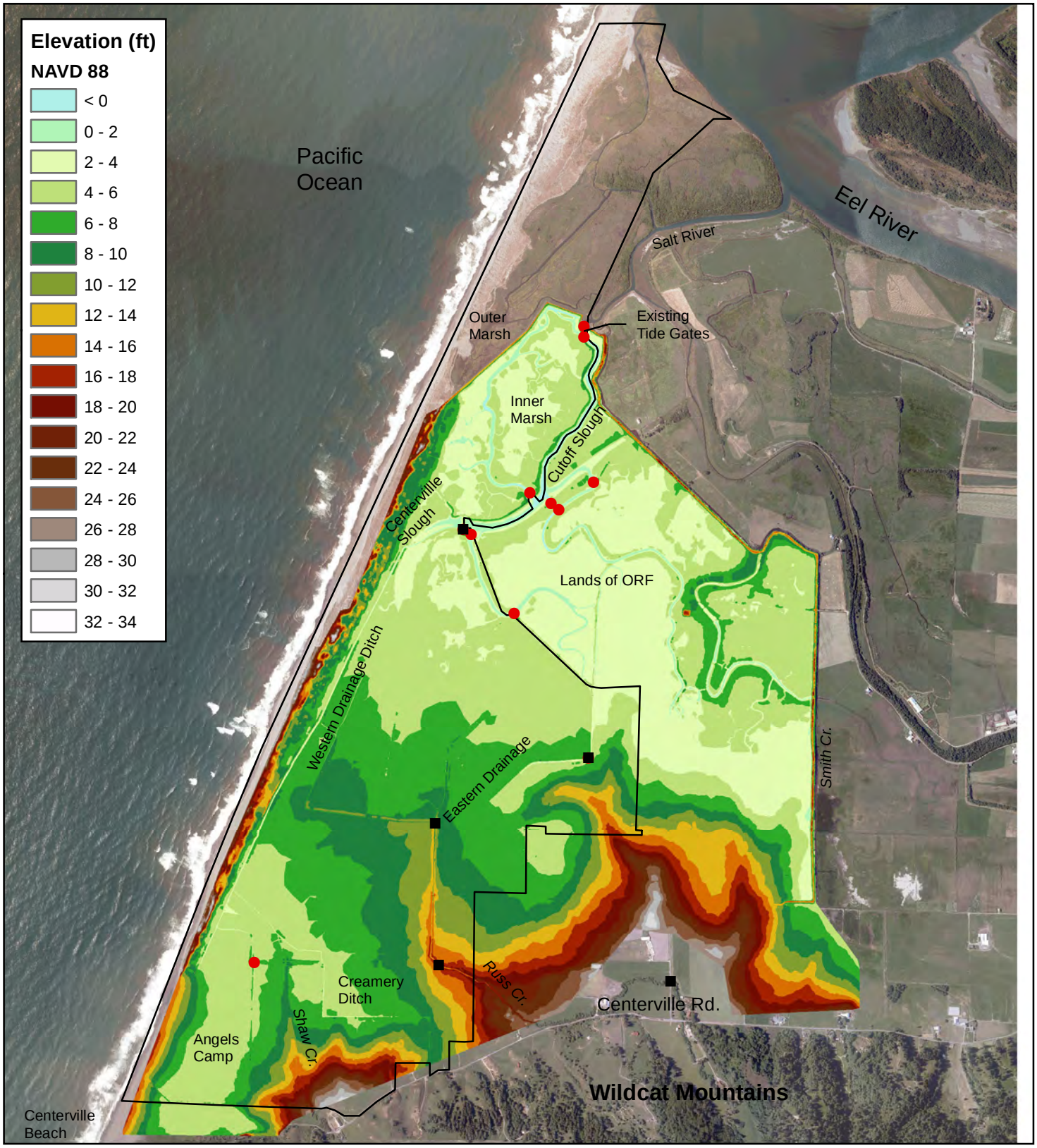

■ Bridge

● Gated Culvert

□ Project Boundary

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Map Projection: Lambert Conformal Conic
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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality
Project Area and Elevation

Job Number 8410882
Revision A
Date 12 Jul 2016

Figure 3.9-1

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality
Historic Site Conditions, 1916

Job Number	8410882
Revision	A
Date	11 Jul 2016

Figure 3.9-2

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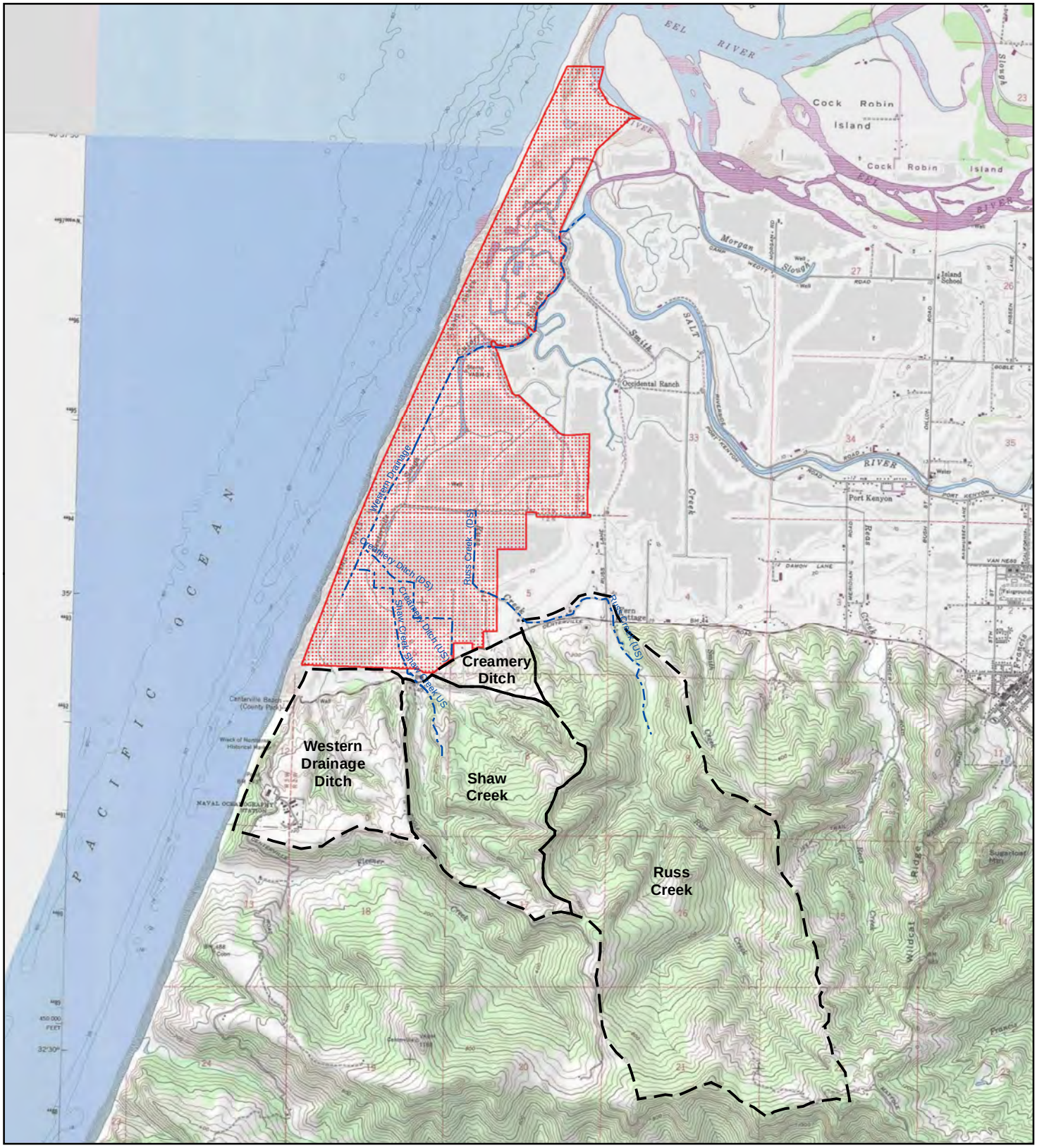

Existing Drainage

Drainage Areas

Project Area

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality Contributing Drainage Areas

Job Number 8410882
Revision A
Date 11 Jul 2016

Figure 3.9-3

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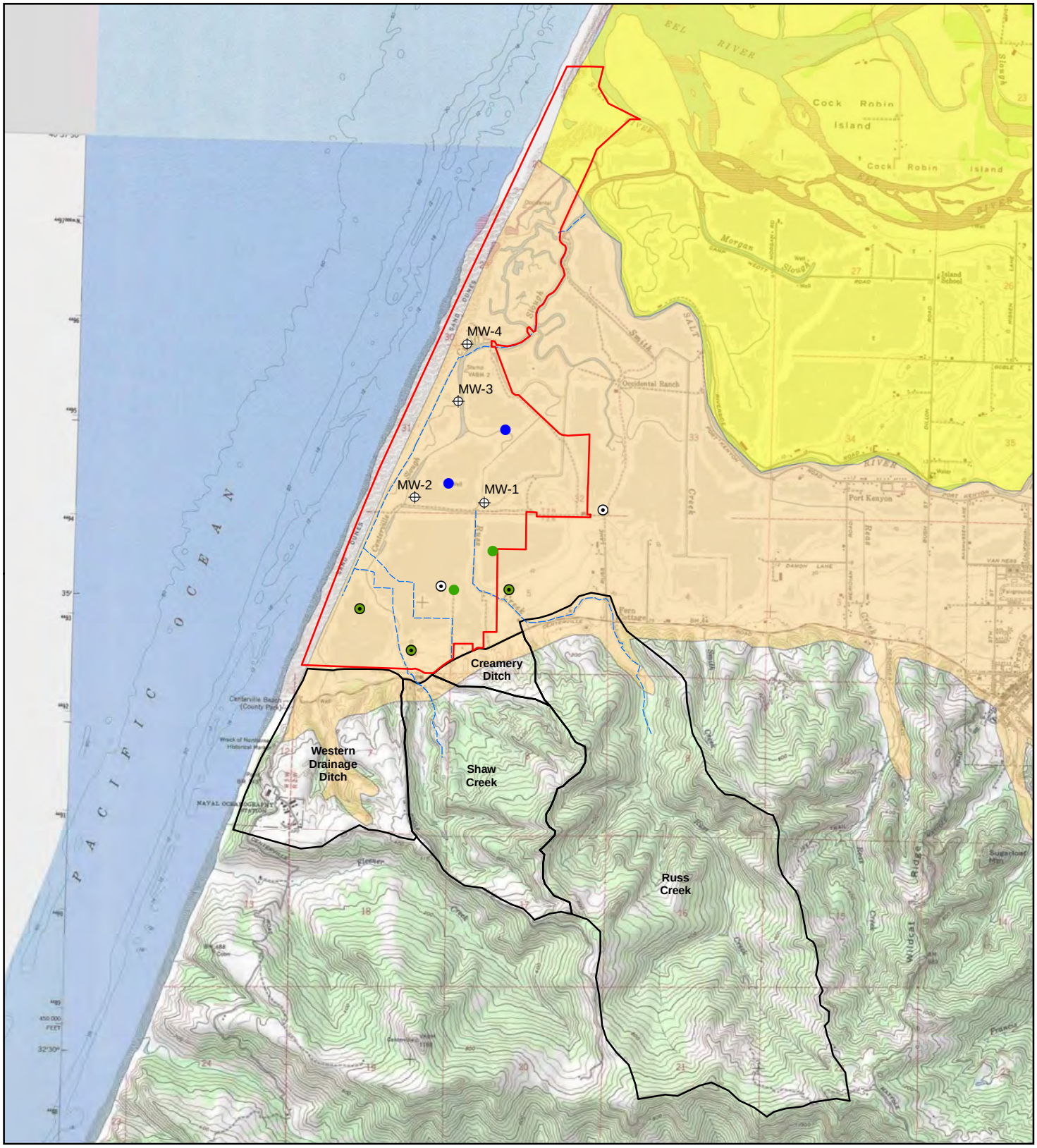

Shallow Groundwater Monitoring Well
Irrigation Well
Stock Watering Well
Stock Watering and Irrigation Well
Artesian Wells
Project Area
Existing Drainage
Drainage Areas

Aquifer Type
Coarse-Grained Alluvium
Fine Grained Alluvium

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Eel River Estuary and Centerville Slough Enhancement Project EIR

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Hydrology and Water Quality
Shallow Groundwater Aquifers

Figure 3.9-4

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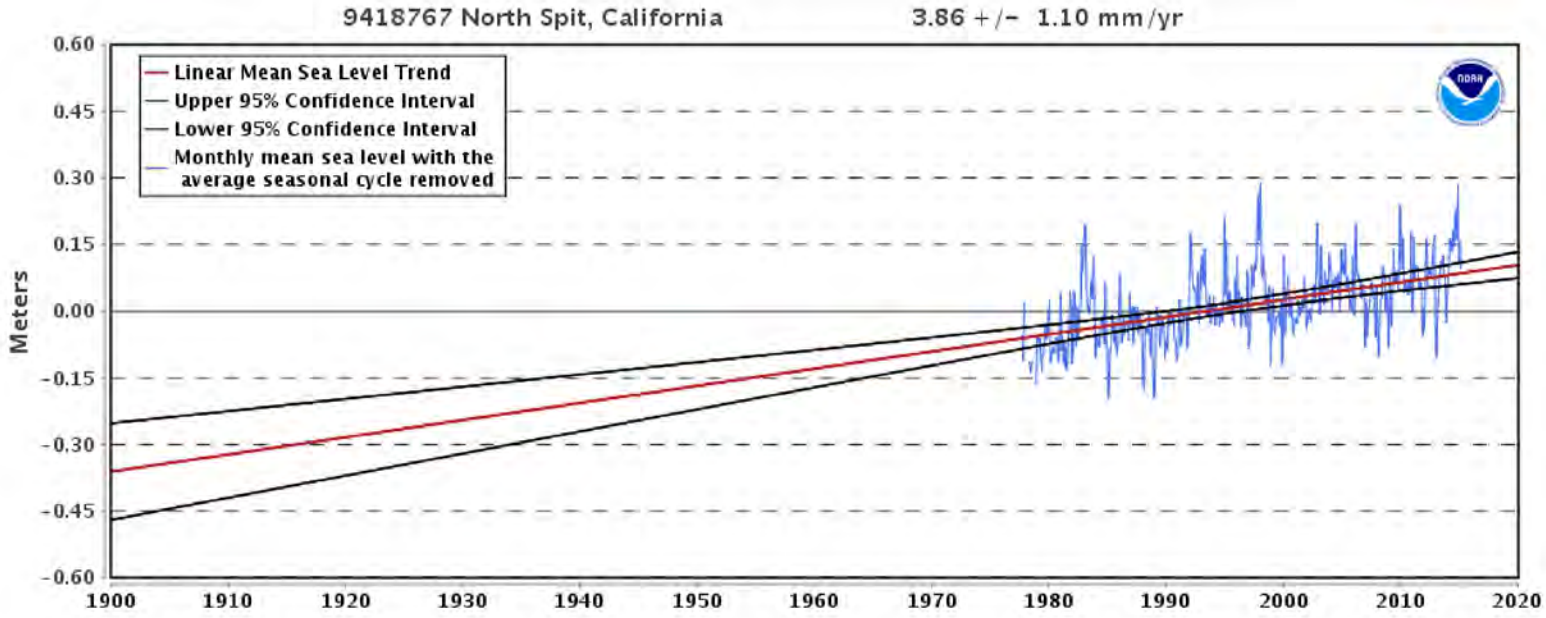

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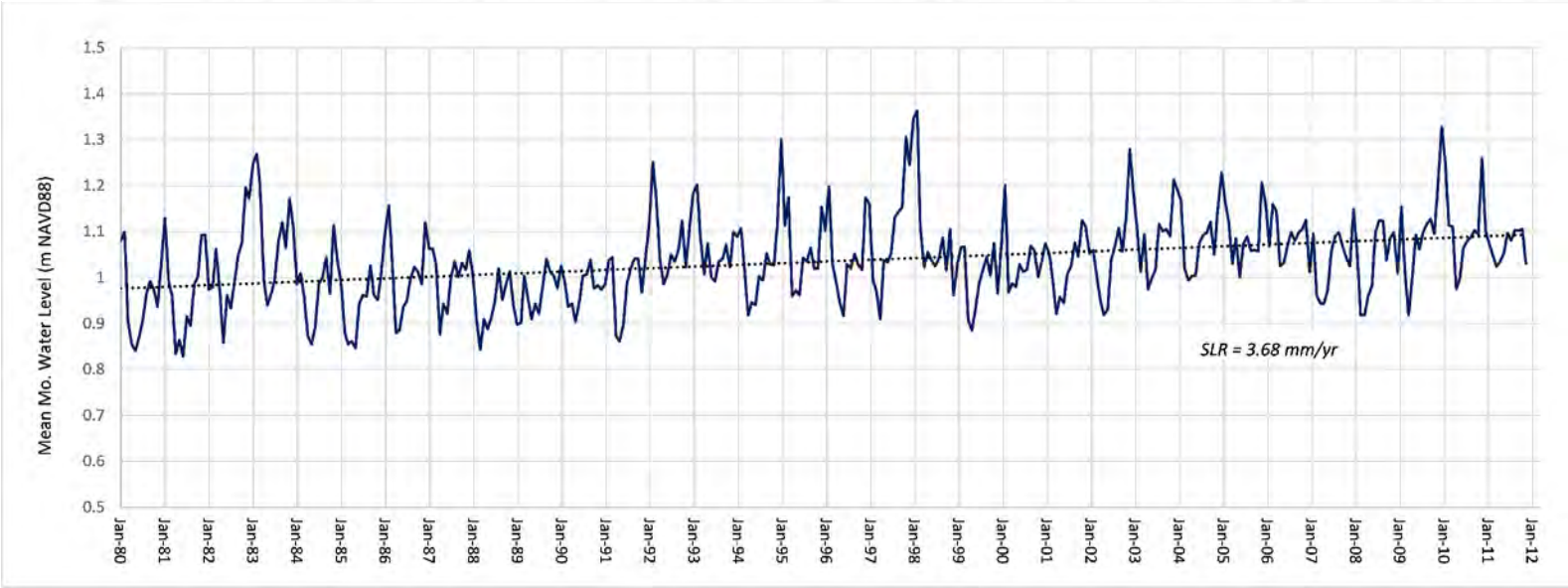

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a) NOAA plot based on water level monitoring data for Mean monthly water levels at NOAA Tide Gauge 9418767;

b) Mean monthly water levels at NOAA Tide Gauge 9418767: North Spit Humboldt Bay (1980-2011).

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality
Estimated Rates of
Sea Level Rise

Job Number	8410882
Revision	A
Date	11 Jul 2016

Figure 3.9-5

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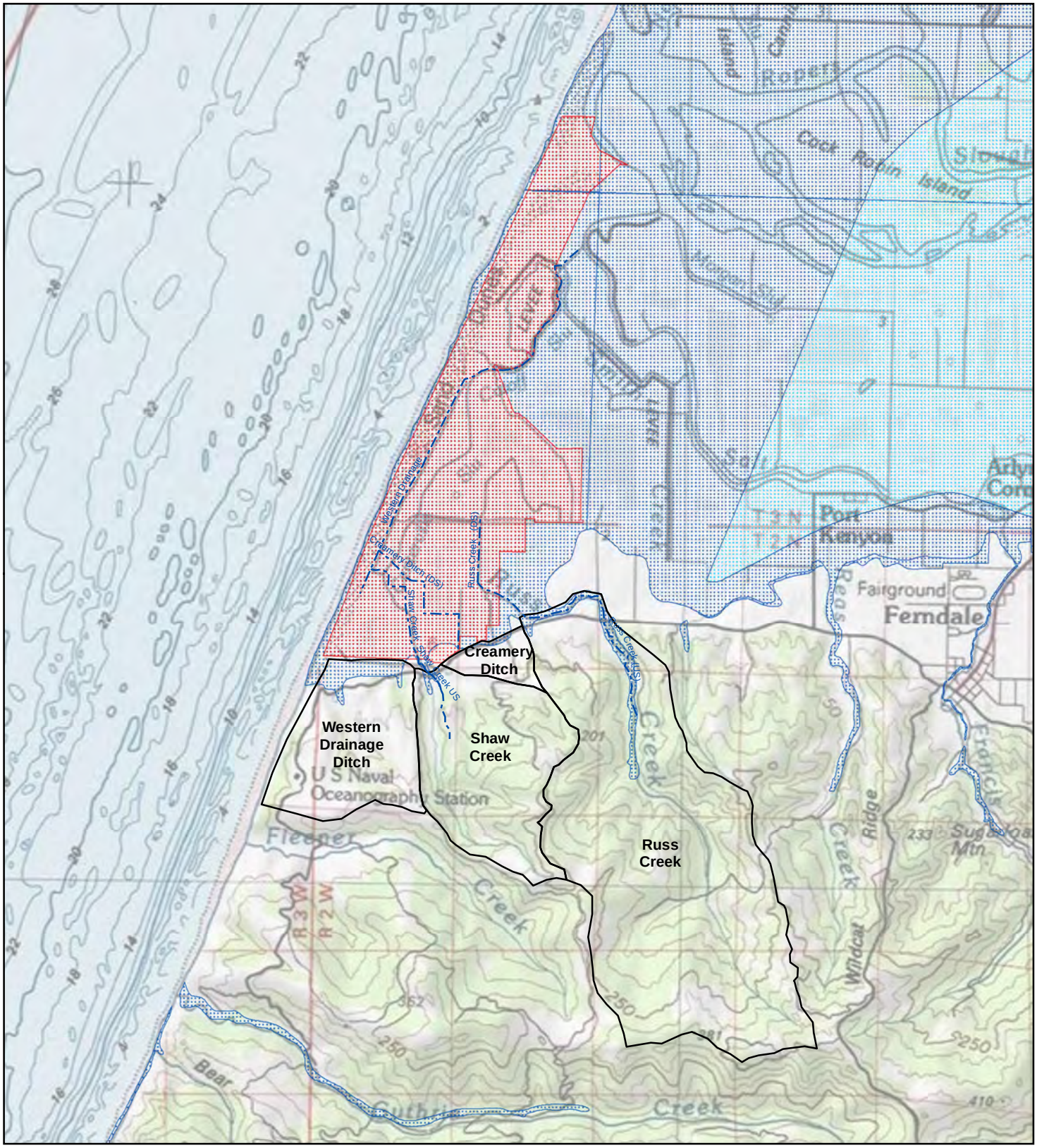

FEMA Floodplain

FEMA Floodway

Project Area

Drainage Areas

Existing Drainage

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality
FEMA Flood Zones

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Revision A
Date 11 Jul 2016

Figure 3.9-6

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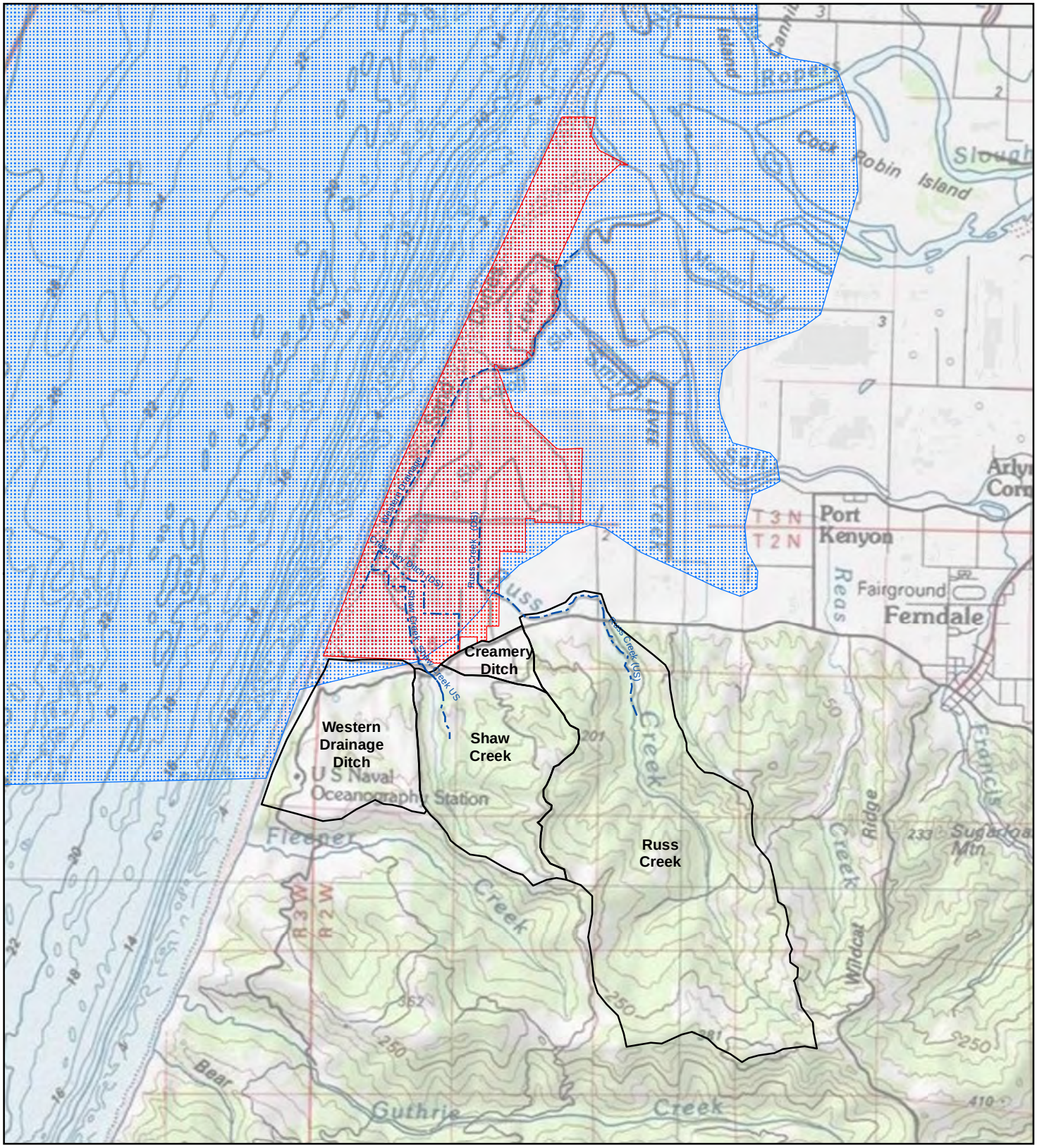

Tsunami Wave Runup

Existing Drainage

Project Area

Drainage Areas

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Paper Size 8.5" x 11" (ANSI A)

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Map Projection: Lambert Conformal Conic
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Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number 8410882
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Date 11 Jul 2016

Hydrology and Water Quality
Tsunami Wave Run-Up Boundary

Figure 3.9-7

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Eel River Estuary and Centerville Slough Enhancement Project EIR

Hydrology and Water Quality
Locations of Simulated Water Levels and Velocities

Job Number	8410882
Revision	A
Date	11 Jul 2016

Figure 3.9-8

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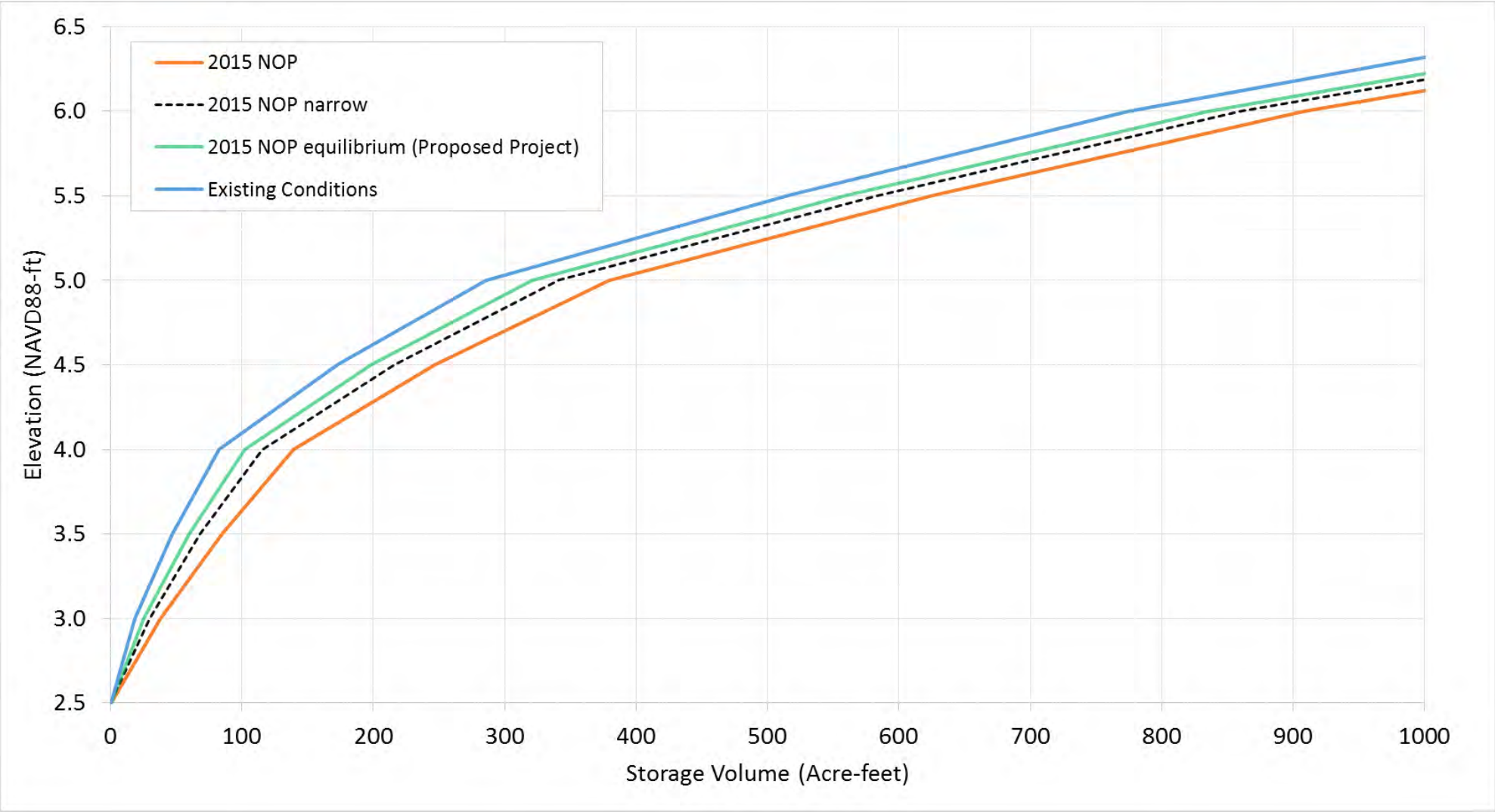

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Flood storage-volume above datum elevation of 2.5-feet NAVD88 for selected Project Alternatives.

Eel River Estuary and Centerville Slough Enhancement Project EIR

Job Number	8410882
Revision	A
Date	11 Jul 2016

Hydrology and Water Quality
Flood Storage-Volume

Figure 3.9-9

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3.10 Land Use and Planning

This section contains a discussion of the existing land use and planning setting for the proposed Project and surrounding area and evaluates the potential impacts related to land use and planning during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the existing land use and zoning for the Project area and the Regulatory Framework section describes the regulatory background that applies to the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential land use and planning impacts, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to less-than-significant levels.

3.10.1 Setting

Existing Land Use

The Project area is located near Ferndale, in Humboldt County. The area is bounded by the Pacific Ocean, the Eel River, Cut-off Slough and Centerville Road at the base of the Wildcat Hills. Described in detail in the Project Description (Chapter 2) and Agricultural Resources (Section 3.2), the Project footprint and broader Project area reflect a strong tradition of ambitious land conversion and intensive agricultural management over the last 150 years. Agricultural use predominates to this day, with some localized recreational use as described in Recreation (Section 3.15).

Surrounding Land Use

Land uses in the vicinity of the proposed Project mirror the Project area, with agricultural use predominating, and minor recreational use intermixed throughout the Eel River Delta.

General Plan Land Use and Zoning

A general plan can be described as a city/county's blueprint for future development. It has a long-term outlook, identifying the types of development that will be allowed, the spatial relationships among land uses, and the general pattern of future development and circulation. Due to a nearly 10-year but ultimately unsuccessful attempt by the Board of Supervisors to complete a General Plan Update for the County, Humboldt County's General Plan (adopted in 1984) remains the guiding plan for the Project area and surrounding unincorporated area. Unrelated to the Project, an updated Housing Element was adopted by the Humboldt County Board of Supervisors on August 28, 2009, and revisions to the Housing Element were adopted on April 27, 2010. All other elements of the 1983 General Plan remain in force until a new County General Plan is adopted.

According to the Humboldt County General Plan (HCGP 1983), approximately 1,807-acres, or 98 percent, of the Project area is designated for agricultural uses (Agricultural Exclusive [AE-60/W,F,R,T]) (Figure 3.2-7). Approximately 32-acres or one percent, including Centerville and Cut-off sloughs, are zoned NR/R for natural resource use (Figure 3.10-1).

The Project is in the Coastal Zone, and the County of Humboldt administers the Coastal Act in the Project Area via the Local Coastal Program (LCP) Eel River Area Plan (ERAP). The ERAP contains policies related to coastal land use, as required by the California Coastal Act of 1976. The ERAP outlines numerous policies pertaining to the preservation and restoration of sensitive coastal habitat, as well as strong provisions in support of agriculture. All of these policies have influenced the development of the Project designs intended to address agricultural preservation

and habitat restoration within the Coastal Zone generally, and within the jurisdiction of Humboldt County's ERAP area, particularly.

The ERAP was certified by the Coastal Commission in 1982 and last updated in 1995. In addition, policies in the Humboldt County General Plan that are not related to coastal land use (and that are not superseded by the policies of the Eel River Area Plan) may also apply to the Project site. The land use designations of the Project site in the ERAP (the LCP applicable to the Project site) are the same as those of the Humboldt County General Plan.

The zoning of the Project area is primarily Agriculture Exclusive, 60-Acre Minimum (AE-60) (see Figure 3.10-1). Conditionally permitted uses in the AE-60 zone include wetland restoration, fish and wildlife management, watershed management, and resource-related recreation. The zoning of slough and other portions of the Project are Natural Resources (NR/R). The principally permitted use for natural resources zoned land is management for fish and wildlife. Conditionally permitted uses in the NR/R zone include wetland restoration, development of hunting blinds and similar minor facilities, improvement of boating facilities in estuaries, accessway development and improvement and removal of trees for firewood, disease control and public safety purposes.

The Project would include rehabilitation of upper watershed areas on RR&T. These may fall within the County's Inland Zoning Regulations and may trigger compliance with the County's Streamside Management Area Ordinance (SMAO). Watershed rehabilitation work has been found to be exempt from the SMAO when covered by an environmental document and the work is done with all required permits from responsible and trustee agencies (e.g., U.S. Army Corps of Engineers and California Fish and Game Sec. 1600 Streambed Alteration Agreement) (Werner, 2007 in Salt River EIR).

3.10.2 Regulatory Framework

Federal

There are no federal land use plans, policies or regulations regulating local land use.

State

The Williamson Act, described and discussed in Agricultural Resources (Section 3.2), is relevant to the Project area. Reference Section 3.2.2 for a discussion of the Williamson Act.

Coastal Act Policy

The proposed Project is within the California Coastal Act's Coastal Zone. Multiple Coastal Act policies governing land and marine resources apply to the proposed Project. Coastal Act Sections applicable to land use include:

Section 30001.5 Legislative findings and declarations; goals

The Legislature further finds and declares that the basic goals of the state for the coastal zone are to:

(a) Protect, maintain, and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and artificial resources.

(b) Assure orderly, balanced utilization and conservation of coastal zone resources taking into account the social and economic needs of the people of the state.

(c) Maximize public access to and along the coast and maximize public

recreational opportunities in the coastal zone consistent with sound resources conservation principles and constitutionally protected rights of private property owners.

(d) Assure priority for coastal-dependent and coastal-related development over other development on the coast.

(e) Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

Section 30233 Diking, filling or dredging; continued movement of sediment and nutrients

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

(1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.

(2) Maintaining existing, or restoring previously dredged, depths in existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(5) Incidental public service purposes, including, but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.

(6) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource-dependent activities.

(b) Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Dredge spoils suitable for beach replenishment should be transported for such purposes to appropriate beaches or into suitable longshore current systems.

(c) In addition to the other provisions of this section, diking, filling, or dredging

in existing estuaries and wetlands shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division. For the purposes of this section, "commercial fishing facilities in Bodega Bay" means that not less than 80 percent of all boating facilities proposed to be developed or improved, where such improvement would create additional berths in Bodega Bay shall be designed and used for commercial fishing activities.

(d) Erosion control and flood control facilities constructed on watercourses can impede the movement of sediment and nutrients, which would otherwise be carried by storm runoff into coastal waters. To facilitate the continued delivery of these sediments to the littoral zone, whenever feasible, the material removed from these facilities may be placed at appropriate points on the shoreline in accordance with other applicable provisions of this division, where feasible mitigation measures have been provided to minimize adverse environmental effects. Aspects that shall be considered before issuing a coastal development permit for such purposes are the method of placement, time of year of placement, and sensitivity of the placement area.

Section 30241. The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the area's agricultural economy and conflicts shall be minimized between agricultural and urban land uses through all of the following:

(c) By developing available lands not suitable for agriculture prior to the conversion of agricultural lands.

(d) By assuring that public service and facility expansions and non-agricultural development do not inhibit agricultural viability, either through increased assessment costs or degraded air and water quality.

Public Resource Code §30241 seeks to maintain the maximum amount of prime agricultural land to assure the protection of the area's agricultural economy and minimize conflicts between agricultural and urban land uses (see Section 3.2, Agricultural Resources). Public Resource Code §30230 seeks to maintain, enhance, and, where feasible, restore marine resources. The California Coastal Commission, which has permit jurisdiction over the Project site, will have to balance these policies when considering the Coastal Development Permit (CDP) for this Project.

Regional and Local

Humboldt County General Plan

The following Humboldt County General Plan policies are applicable to the proposed Project. The HCGP includes the following goal which is applicable to the Project.

2522 Goal The optimum amount of agricultural land shall be conserved for and maintained in agricultural use to promote and increase Humboldt County's agricultural production.

Much of the HCGP's discussion of agricultural protection concerns conversion of agricultural land to urban use. The following agricultural protection policies are relevant to the Project's conversion of agricultural land to natural resource use:

2523 Policies

1. *Agricultural lands shall be conserved and conflicts minimized between agricultural and non-agricultural uses through the following:*

   B. *By focusing future conversions in areas where land use conflicts would not threaten the viability of existing agriculture.*

   D. *By allowing development of uneconomical or marginally viable agricultural land, or agricultural lands already severely limited by conflicts with urban uses to limit the market pressures for conversion of more productive lands.*

   E. *By assuring that public service and facility expansions and non-agricultural development do not inhibit agricultural viability through degraded water supplies, access systems, air quality, and other relevant considerations, such as increased assessment costs.*

4. *Prime agricultural land should be retained in parcel sizes large enough to provide for an economic management base.*

10. *The conversion of agricultural land should only be considered where continued agricultural production is not economically feasible and proposed development is consistent with Remote Rural Development Section 2550.*

The ERAP, which was adopted by the Humboldt County Board of Supervisors on March 9, 1982 and certified by the State Coastal Commission on April 8, 1982, is the LCP applicable to the Project site. The ERAP contains policies related to coastal land use, as required by the California Coastal Act of 1976. In addition, policies in the Humboldt County General Plan that are not related to coastal land use (and that are not superseded by the policies of the ERAP) also apply to the Project site.

The land use designations of the Project site in the ERAP (the LCP applicable to the Project site) are the same as those of the Humboldt County General Plan.

Humboldt County General Plan policies applicable to the proposed Project include:

3330 Water Quality

3360 Goal

1. *To maintain or enhance the quality of the County's water resources and the fish and wildlife habitat utilizing those resources.*

3361 Policies

1. *Ensure that land use decisions are consistent with the long term value of water resources in Humboldt County.*

2. *Regulate development that would pollute watershed areas.*

3. *Continue participation in all state, regional or local water resource planning efforts effecting surface run-off or groundwater supplies.*

4. *Support the development of fisheries enhancement projects on small Humboldt County streams.*

3400 Biological Resources

3430 Goal

1. *To maximize where feasible, the long-term public and economic benefits from the biological resources within the County by maintaining and restoring fish and wildlife habitats.*

3431 Policies

1. *Maintain values of significantly important habitat areas by assuring compatible adjacent land uses, where feasible.*
2. *Habitats for "critical species" shall be protected under provisions of NEPA and CEQA.*
3. *Development within stream channels shall be permitted when there is no less environmentally damaging feasible alternative, where the best feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to essential, non-disruptive projects as listed in Standard 6.*
4. *To protect sensitive fish and wildlife habitats and to minimize erosion, runoff and interference with surface water flows, the County shall maintain Streamside Management Areas (SMA), along its blue line streams as identified on the largest scale U.S.G.S. topographic maps most recently published, and any significant drainage courses identified through the CEQA process.*
5. *Development within the Streamside Management Areas shall be permitted where mitigation measures (Standard 8) have been provided to minimize any adverse environmental effects, and shall be limited to uses as described in Standard 7.*

Project Review

1. *The Biological Resource Maps shall be incorporated into the project review process in order to identify sensitive habitat concerns. These maps shall be kept up to date with the most recent information obtainable. Accommodation of new resource information on the Biological Resource Maps may require an amendment to the adopted General Plan.*
2. *The County should request the Department of Fish and Game, as well as other appropriate agencies and organizations to review plans for development within sensitive habitat areas or Streamside Management Areas. Recommended mitigation measures shall be considered prior to project approval.*

3432 Standards

Stream Channels

1. *Development within stream channels is limited to the following projects.*
   - *A. Fishery, wildlife, and aquaculture enhancement and restoration projects.*
   - *B. Road crossings consistent with Standard 9 of this section.*
   - *C. Flood control and drainage channels, levees, dikes and floodgates.*
   - *D. Mineral extraction consistent with other County regulations.*
   - *E. Small scale hydroelectric power plants in compliance with applicable County regulations and those of other agencies.*

F. Agricultural diversions and wells.

G. New fencing, so long as it would not impede the natural drainage or would not adversely affect the stream environment or wildlife.

H. Bank protection, provided it is the least environmentally damaging alternative.

I. Other essential projects, including municipal groundwater pumping stations, provided they are the least environmentally damaging alternative, or necessary for the protection of the public's health and safety.

Streamside Management Areas

1. Development within Streamside Management Areas shall be limited to the following uses:

A. Development permitted within stream channels.

B. Timber management and harvests not otherwise excluded by Applicability Section as well as noncommercial cutting of firewood and clearing for pasturage, provided:

1) Cottonwoods are retained.

2) Remaining willows and alders, as well as other unmerchantable hardwoods or shrubs should be protected from unreasonable damage.

C. Road and bridge replacement or construction, when it can be demonstrated that it would not degrade fish and wildlife resources or water quality, and that vegetative clearing is kept to a minimum.

D. Removal of vegetation for disease control or public safety purposes.

2. Mitigation measures for development within Streamside Management Areas shall, at a minimum, include:

A. Retaining snags unless felling is required by CAL-OSHA, or by California Department of Forestry forest and fire protection regulations, or for public health and safety reasons, approved by the appropriate County department. Felled snags shall be left on the ground if consistent with fire protection regulations as long as they have no economic value.

B. Retain live trees with visible evidence of use as nesting sites by hawks, owls, eagles, osprey, herons, or egrets.

C. Replanting of disturbed areas with riparian vegetation (including such species as alders, cottonwoods, willows, sitka spruce, etc.) shall not be required unless natural regeneration does not occur within two years of the completion of the development project.

D. Erosion control measures (Standard 9).

3. Erosion control measures for development within Streamside Management Areas shall include the following:

A. During construction, land clearing and vegetation removal will be minimized.

B. Construction sites will be planted with native or naturalized vegetation and mulched with natural or chemical stabilizers to aid in erosion control and insure revegetation.

C. Long slopes will be minimized to increase infiltration and reduce water velocities down cut slopes by such techniques as soil roughing, serrated cuts, selective grading, shaping, benching, and berm construction.

D. Concentrated runoff will be controlled by the construction and continued maintenance of culverts, conduits, nonerodible channels, diversion dikes, interceptor ditches, slope drains or appropriate mechanisms. Concentrated runoff will be carried to the nearest drainage course. Energy dissipaters may be installed to prevent erosion at the point of discharge where discharge is to natural ground or channels.

E. Runoff shall be controlled to prevent erosion by on-site or off- site methods. On-site methods include, but are not limited to, the use of infiltration basins, percolation pits, or trenches. On-site methods are not suitable where high groundwater or slope stability problems would inhibit or be aggravated by on-site retention or where retention will provide no benefits for groundwater recharge or erosion control. Off-site methods include detention or dispersal of runoff over non- erodible vegetated surfaces where it would not contribute to downstream erosion or flooding.

F. Disposal of silt, organic, and earthen material from sediment basins and excess material from construction will be disposed of out of the Streamside Management Area to comply with California Fish and Game and Regional Water Quality Control Board.

4. Winter operations (generally October 15 thru April 15) shall employ the following special considerations:

A. Slopes will be temporarily stabilized by stage seeding and/or planting of fast germinating seeds such as barley or rye grass; and mulched with protective coverings such as natural or chemical stabilizations.

B. Runoff from the site will be temporarily detained or filtered by berms, vegetated filter strips, and/or catch basins to prevent the escape of sediment from the site. Drainage controls are to be maintained as long as necessary to prevent erosion throughout construction.

Eel River Area Plan

The Project is in the Coastal Zone, and the County of Humboldt administers the Coastal Act in the Project Area via the LCP ERAP. The ERAP was certified by the Coastal Commission in 1982 and last updated in 1995. The ERAP outlines numerous policies pertaining to the preservation and restoration of sensitive coastal habitat, as well as strong provisions in support of agriculture. All of these policies have influenced the development of the proposed Project designs intended to address agricultural preservation and habitat restoration within the Coastal Zone generally, and within the jurisdiction of Humboldt County's ERAP area, particularly. The following policies of the ERAP are applicable to the Project.

3.34 A. Identification of Agricultural Lands – Prime/Non-Prime

1 Lands outside Urban Limit Lines that are prime agricultural lands based on the adopted definition of prime lands of the State of California shall be planned for continued agricultural use, and no division or development of such lands shall be approved which would lower the economic viability of continued agricultural operations on them.

3.41 C. Transitional Agricultural Wetlands Identification and Development Policies

1. Transitional Agricultural lands are wetlands as defined in Chapter 6 (Definitions) of this Plan.

2. Allowable uses in Transitional Agricultural Lands: Within transitional agricultural lands planned for Agriculture Exclusive, agriculture is the principal use in these areas but shall maintain long-term protection by ensuring new development is consistent with the provisions of this policy…."

b. Diking and filling for new development in transitional agricultural lands shall be limited to…the principal uses in agricultural exclusive designation, including construction of spillways and modification or repair of existing dikes threatened by erosion.

c Dredging in transitional agricultural lands shall be limited to…maintenance and repair of existing tidegates, floodgates, dikes, levees and other drainage works, including replacement of drainage works damaged by flood or tidal surges.

e. Mitigation for these uses by restoration of tidal action or removal of fill…is not feasible and shall not be required. Mitigation should where feasible take place in the Eel River Planning Area and where practicable as close as possible to the development."

With regard to the protection and enhancement of natural resources, Section 3.34 B states that management for watershed and fish and wildlife is a compatible use with agriculture.

In addition to the above guidelines, the following policies are applicable to the proposed Project.

Policy 3.41: "Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values"

Policy 3.41 1.a.(2): "The County shall continue to pursue opportunities to restore or enhance, if possible, in-stream flows"

Policy 3.41 F.6.a: "long-term protection of riparian vegetation . . . should be provided. . . . To achieve these objectives, the County should work with property owners and affected State and Federal agencies"

Policy 3.41 G.7: "Natural drainage courses . . . shall be retained and protected from development which would impede the natural drainage pattern or have a significant adverse effect on water quality or wildlife habitat."

Humboldt County Zoning Regulations

The Humboldt County Zoning Regulations were revised April 30, 2007, and provide clear guidance on allowable uses in the Project area. In particular, Section 313-35 defines combining zone designations for Transitional Agricultural Lands:

35.1.1 Purpose. The purpose of these regulations is to permit agricultural use as a principal permitted use while providing that development in transitional agricultural lands is

conducted in such a manner as to maintain long-term wetland habitat values and minimize short-term habitat degradation within these environmentally sensitive habitat areas.

35.1.2 Applicability. These regulations shall apply to land containing transitional agricultural land designated "T" on the Zoning Maps, and to unmapped areas as defined in this Chapter, Section C…."

35.1.9 Permitted Diking and Filling. Permitted diking and filling shall be limited to the following developments:

35.1.9.1 Principal permitted uses in the AE Agricultural Exclusive zone.

35.1.9.2 Construction of spillways and modification and repair of existing dikes threatened by erosion. Modification of dikes includes minor relocation….provided, however, that there is no significant increase in gross acreage under cultivation.

35.1.9.5 Wetland Restoration

35.1.10 Permitted Dredging. *Dredging in Transitional Agricultural land shall be limited to:*

35.1.10.2 Maintenance or replacement of levees, roads, fences, dikes, drainage channels, floodgates, and tide gates;

35.1.10.3 Maintenance dredging for flood control and drainage purposes; and

35.1.10.4 Wetlands, fishery and wildlife enhancement, and restoration projects.

35.1.12 ***Findings Required.*** *Prior to approval of new development within Transitional Agricultural Lands, the applicable Resource Protection Impact Findings of Chapter 2, Procedures, Supplemental Findings, shall be made.*

3.10.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to land use and planning, as defined by the CEQA Guidelines (Appendix G), if it would:

- Physically divide an established community;
- 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; or
- Conflict with any applicable habitat conservation plan or natural community conservation plan.

3.10.4 Methodology

For the purposes of this impact analysis, a significant impact would occur if implementation of the proposed Project would result in inconsistencies or conflicts with the adopted goals and policies of the Humboldt County General Plan and/or applicable rules and regulations of the Humboldt County Zoning Code.

Areas of No Project Impact

Construction and operation of the Project would not result in impacts related to two of the significance criterion identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reason:

Physically divide an established community. There are no residential uses within the Project site and the Project site is not part of an established community. The nearest community is Ferndale approximately four miles to the east. Therefore, the Project would not divide an established community. No aspect of the Project would physically divide the community of Ferndale. Therefore, this significance criterion is not applicable to the Project and is not discussed further.

Conflict with any applicable habitat conservation plan or natural community conservation plan. There are no habitat conservation plans or natural community conservation plans applicable to the Project. Therefore, this significance criterion is not applicable to the Project and is not discussed further.

3.10.5 Impacts and Mitigation Measures

Impact: LU-1: Would the project 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.

The proposed Project would convert agricultural land in the Project area, primarily within the channel footprint, to non-agricultural uses (marsh, wetlands, and berms), which may conflict with policies of the ERAP and the 1983 Humboldt County General Plan stipulating preservation of agricultural land, and is considered a potentially adverse impact. However, the Project would result in a net increase in agricultural productivity for agricultural lands in the Project construction footprint and in the Project Area and vicinity by providing protection from sea level rise, improving drainage and providing a long-term agricultural management strategy for the Russ Creek Avulsion Area (RCAA). For these reasons, the Project is consistent with policies relating to agricultural land preservation. These impacts of the Project on agricultural productivity are addressed in more detail in Section 3.2 (Agricultural Resources).

The proposed Project would be consistent with the other applicable goals and policies of the ERAP and the 1983 Humboldt County General Plan identified in Applicable Land Use Plans, Zoning, and Ordinances, above.

The 1983 Humboldt County General Plan designates the Project area a combination of Agricultural Exclusive (AE), Agriculture Grazing (AG), and Timber Production (T). The zoning of the Project area is Agricultural Exclusive, 60-Acre Minimum (AE-60), and the zoning of the other portions of the Project area is Natural Resources (NR/R). Conditionally permitted uses in the AE-60 zone include wetland restoration, fish and wildlife management, watershed management, and resource-related recreation. Thus, the proposed Project would be consistent with the applicable land use designations and zoning for the site. The Project would require a Conditional Use Permit (CUP) from Humboldt County.

Because the Project is within the Coastal Zone of the County, it would require a CDP from both Humboldt County and the California Coastal Commission. It also would require a County grading permit.

All agency consultations, technical assistance, and permits would be completed prior to Project implementation. In addition, the Project is consistent with the natural resource protection requirements of the California Coastal Act and has been designed to mitigate any potential impacts related to land use.

In conclusion, the Project would not result in impacts from conflicts with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.10.6 Cumulative Impacts

Impact: LU-C-1: Would the project result in cumulatively considerable contribution to a significant cumulative impact related to land use and planning.

As discussed in Agricultural Resources (Section 3.2) there are projects underway in the Eel River Delta that individually and collectively have a comparable potential to impact and benefit land use generally, and agricultural resources, specifically. These include the Salt River Ecoystem Restoration Project, the Ocean Ranch Project, and multiple projects underway by the NRCS and U.S. Fish and Wildlife Service (USFWS –Partners Program). Most of these projects share the common goal of restoring habitat while improving drainage on agricultural properties in the area. As described in this EIR, appropriate studies were undertaken to ensure that agricultural resources that could be impacted by the Project were identified, and that avoidance or offsetting measures reduce the impacts of the Project to known agricultural resources to a less-than-significant level. These measures are consistent with Humboldt County General Plan Policies and Public Resources Code § 30241. Therefore, the Project's incremental effect to agricultural resources is not cumulatively considerable and would not contribute to any significant impacts to agricultural resources that may be caused by other cumulative Projects. The Project may provide an incremental benefit to the Salt River Ecosystem Restoration Project, in that the increase in post-Project tidal prism and flow energy through lower Cut-Off Slough and Salt River would increase the sediment transport capacity through downstream reaches of the Salt River. This change would enhance and better sustain a primary objective of enhanced sediment transport for the Salt River Ecosystem Restoration Project. Enhanced water and sediment flow through the downstream reaches would also better maintain the restoration efforts associated with the proposed Project. Altogether, any cumulative effects on land use designations, particularly agricultural zoning, would be beneficial.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.10.7 References

Humboldt County, 1983, Humboldt County General Plan (HCGP) Volume I Framework Plan.

Humboldt County, 1989, Humboldt County General Plan Volume II Eel River Area Plan of the Humboldt County Local Coastal Program, October.

Project Area **LAND USE** **ZONING**

AE — AE-60/W,F,R,T

NR — NR/R

AE: Agriculture Exclusive
W: Wetland
F: Flood
R: Riparian
T: Transitional Agricultural Lands
NR/R: Natural Resources with Riparian Protection

Paper Size 8.5" x 11" (ANSI A)

0 1,000 2,000 3,000 4,000

Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

N

Eel River Estuary and Centerville Slough Enhancement Project

Job Number	8410882.03
Revision	A
Date	07 Sep 2016

Land Use & Zoning

Figure 3.10-1

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Data source: Humboldt County: Zoning v.35, Land Use Planning v.24; Aerial Imagery, 4 band 0.5ft resolution, NOAA, 2010. Created by:jclark2

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3.11 Mineral and Energy Resources

This section evaluates the potential impacts related to mineral and energy resources during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the existing mineral and energy resources for the Project area and the Regulatory Framework section describes the regulatory background that applies to the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential impacts to mineral and energy resources, and identifies the significance of impacts. Where appropriate, mitigation measures are presented to reduce impacts to less than significant.

3.11.1 Setting

Mineral Extraction

Humboldt County has a wealth of mineral resources. There are 93 extraction sites around the county producing sand and gravel, metals, and stone and clay. Mining provides an input of vital importance to a number of key activities in the construction industry, primarily the raw materials for concrete used in foundations. Mining materials are also used for road construction, maintenance and repair and other important uses (Humboldt County 2012). Mineral extraction sites in the Project vicinity consist of numerous sites along the Eel River and two sites south of the City of Ferndale

Sand and gravel extraction constitute the major portion of the county's mining activity, both in terms of quantity of material produced and value of extracted resource. Extraction sites, mines, pits, and quarries, for mineral extraction are located throughout the county. Mines and quarries in Humboldt County primarily produce shale, stone (base and subbase), and clay. Almost all of these, except the clay quarries, are hard rock quarries. Actual extraction amounts vary depending on local demand. Rock quarries are a significant augmentation of the in-stream sand and gravel mining operations in the county. These quarries provide rock products of various sizes that may not be obtainable from in-stream operations or may be able to provide sand and gravel at more competitive rates due to location or reduced permitting expenses. Most recent surface mining applications in the county have been for upland rock quarry operations due to these factors.

Energy Resources

Energy resources in Humboldt County are primarily natural gas deposits. Active gas wells in Humboldt County are concentrated in the Tompkin Hills Gas Field in the Eel River basin in Humboldt County. There is no record of geothermal production in Humboldt County. The Project Area is not located on or near any substantial known energy source or energy system infrastructure.

3.11.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project related to mineral and energy resources.

State

Mineral Extraction

Surface Mining and Reclamation Act

The Surface Mining and Reclamation Act (SMARA) regulates surface mining operations within California. SMARA is administered by the California Department of Conservation through the California Department of Conservation State Mining and Geology Board (SMGB) and the Office of Mine Reclamation (OMR). SMARA states that "the extraction of minerals is essential to the continued economic well-being of the state and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety (California Department of Conservation 2011)." SMARA encourages the production and conservation of minerals, while also considering "values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment."

Energy Conservation

Warren-Alquist Act State Energy Resources Conservation and Development Act

The Warren-Alquist Act was enacted, and the California Energy Commission was created, to encourage the conservation of non-renewable energy resources. This legislation, among other things, codifies California's policy to use a range of measures to reduce wasteful, uneconomical, and unnecessary uses of energy, thereby reducing the rate of growth of energy consumption, prudently conserving energy resources, and assuring statewide environmental, public safety, and land use goals.

Regional and Local

Humboldt County has adopted regulations to implement the provisions of the Surface Mining and Reclamation Act of 1975 (Public Resources Code Sections 2710 et seq.). These regulations are intended to protect the quality of the county's environment, to restrict land uses that would be incompatible with preservation and use of natural resources and to assure an adequate supply of these resources for present and future generations. A conditional use permit and reclamation plan is required, and development standards are set for surface mining operations (Humboldt County 2012). Humboldt County has adopted Ordinance #1373 to fulfill this State requirement. Standards prevent new mining operations from becoming nuisances to nearby communities and prevent problems of traffic, noise, water quality or visual degradation.

3.11.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to mineral and energy resources, as defined by the CEQA Guidelines (Appendix G), if it would:

- 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;
- 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; or
- Result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, especially fossil fuels such as coal, natural gas, and oil.

3.11.4 Methodology

Existing information sources were reviewed to determine whether any portions of the Project area contain significant mineral and energy resources and to evaluate how these resources, if any, would be affected by the proposed Project.

3.11.5 Impacts and Mitigation Measures

Impact: **ME-1: Would the project 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, or a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.**

The Project area is primarily comprised of fine silt, sand and water, and contains no known mineral resources available for extraction. Although Humboldt County has not yet been included in the California Mineral Land Classification System by the SMGB to designate lands containing mineral deposits of regional or statewide significance, it seems evident that the Project area would not rise to the level of significance for sand or gravel extraction. Sand would however be skimmed from areas adjoining dune overwash areas to construct new dunes and this is discussed in the Geology and Soils Section (Section 3.6).

Therefore, the Project would not result in a loss of mineral resources and would have less-than-significant impacts to mineral resources.

Mitigation: No mitigation is necessary.

Significance: Less than significant.

Impact: **ME-2: Would the project result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, especially fossil fuels such as coal, natural gas, and oil.**

Construction

Construction of the Project would involve extensive excavation and use of heavy equipment as discussed under Air Quality. This construction would require the use of fuels (primarily gas, diesel, and motor oil) for a variety of construction activities, including excavation, grading, and vehicle travel. During these activities, fuel for construction worker commute trips would be minor in comparison to the fuel used by construction equipment. Use of these fuels would not be wasteful or unnecessary because their use is necessary to complete a habitat restoration and agricultural enhancement Project that would provide significant social and economic benefits to the region.

Excessive idling and other inefficient site operations are not anticipated. Because of the small scale of the Project and relatively short construction timeframe, impacts related to the inefficient use of construction-related fuels would be less than significant.

Operation

Operation of the Project area would be limited to existing land uses, particularly agriculture and passive recreation, and would not result in a significant increase in use of energy or use energy in an inefficient or wasteful manner. The impact is less than significant.

Mitigation: No mitigation is necessary.

Significance: Less than significant.

3.11.6 Cumulative Impacts

Impact: **ME-C-1: Would the project result in cumulatively considerable contribution to mineral or energy resources impacts.**

The geographic scope of potential cumulative impacts related to mineral resources consists of any mining related operations in Humboldt County along the Eel River. The geographic scope of potential cumulative impacts related to energy resources consists of the PG&E service area in Northern California (e.g., Humboldt and Trinity counties).

The proposed Project would not contribute to a cumulatively considerable loss of availability of a known mineral resource(s). The proposed Project, in combination with other regional projects would not contribute to inefficient, wasteful, or unnecessary consumption of fuels or other energy resources. The Project's contribution would not be cumulatively considerable because the Project would not use energy in a wasteful or unnecessary manner and the Project would incorporate energy efficiency measures during construction and operation in accordance with the mitigation measures in Section 3.3 (Air Quality).

Mitigation: No mitigation necessary.

Significance: Less than significant.

3.11.7 References

EIA (U.S. Energy Information Administration), 2013, *Frequently Asked Questions*, accessed at: http://www.eia.gov/tools/faqs/faq.cfm?id=97&t=3.

Humboldt County, 2012, *Humboldt County General Plan Update Draft Environmental Impact Report* SCH# 2007012089, April.

3.12 Noise

This section includes existing conditions with regard to noise and vibration, a summary of applicable regulations, and evaluates the potential impacts related to noise and vibration during construction and operation of the Project. The impacts and mitigation measures section establishes the thresholds of significance, evaluates potential noise and vibration impacts, and identifies the significance of impacts. Where appropriate, mitigation is presented to reduce impacts to less-than-significant levels. This section focuses on noise impacts to humans. Potential impacts to wildlife are discussed in Section 3.4 – Biological Resources.

3.12.1 Setting

Fundamentals of Acoustics

Noise may be defined as unwanted sound. Noise is usually objectionable because it is disturbing or annoying. The objectionable nature of sound could be caused by its pitch or its loudness. Pitch is the height or depth of a tone or sound, depending on the relative rapidity (frequency) of the vibrations by which it is produced. Higher pitched signals sound louder to humans than sounds with a lower pitch. Loudness is intensity of sound waves combined with the reception characteristics of the ear. Intensity may be compared with the height of an ocean wave in that it is a measure of the amplitude of the sound wave.

In addition to the concepts of pitch and loudness, there are several noise measurement scales which are used to describe noise in a particular location. A decibel (dB) is a unit of measurement that indicates the relative amplitude of a sound. The zero on the decibel scale is based on the lowest sound level that the healthy, unimpaired human ear can detect. Sound levels in decibels are calculated on a logarithmic basis. An increase of 10 decibels represents a ten-fold increase in acoustic energy, while 20 decibels is 100 times more intense, 30 decibels is 1,000 times more intense, etc. There is a relationship between the subjective noisiness or loudness of a sound and its intensity. Each 10 decibel increase in sound level is perceived as approximately a doubling of loudness over a fairly wide range of intensities. Technical terms are defined in Table 3.12-1.

There are several methods of characterizing sound. The most common method in California is the A-weighted sound level or (dBA). This scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events. This energy-equivalent sound/noise descriptor is called Leq. The most common averaging period is hourly, but Leq can describe any series of noise events of arbitrary duration.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus one dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends upon the distance the receptor is from the noise source. Close to the noise source, the models are accurate to within about plus or minus one to two dBA.

Since the sensitivity to noise increases during the evening and at night, and because excessive noise interferes with the ability to sleep, 24-hour descriptors have been developed that incorporate artificial noise penalties added to quiet-time noise events. The Day/Night Average Sound Level

(Ldn) is average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM. The Community Noise Equivalent Level, (CNEL), is a measure of the cumulative noise exposure in a community, with a five dB penalty added to evening (7:00 PM - 10:00 PM) and a 10 dB addition to nocturnal (10:00 PM - 7:00 AM) noise levels.

Table 3.12-1 Definitions of Acoustical Terms

Term	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this section are A-weighted, unless indicated otherwise.
L01, L10, L50, L90	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, Leq	The average A-weighted noise level during the measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels in the evening from 7:00 PM to 10:00 PM and after addition of 10 decibels to sound levels in the night between 10:00 PM and 7:00 AM.
Day/Night Noise Level, Ldn or DNL	The average A-weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10:00 PM and 7:00 AM.
Lmax, Lmin	The maximum and minimum A-weighted noise level during the measurement period.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.

Fundamentals of Groundborne Vibration

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several methods are typically used to quantify the amplitude of vibration including Peak Particle Velocity (PPV) and Root Mean Square (RMS) velocity. PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. RMS velocity is defined as the average of the squared amplitude of the signal, usually measured in decibels referenced to one micro-in/sec and reported in VdB (velocity decibels). PPV and VdB vibration velocity amplitudes are used in this analysis to evaluate the effect on buildings and human response to vibration.

Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. This rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows. In urban environments sources of groundborne vibration include construction activities, light and heavy rail transit, and heavy trucks and buses.

Construction activities can cause vibration that varies in intensity depending on several factors. The use of pile driving and vibratory compaction equipment typically generates the highest construction related groundborne vibration levels. Because of the impulsive nature of such activities, the use of the PPV descriptor has been routinely used to measure and assess groundborne vibration and almost exclusively to assess the potential of vibration to induce structural damage and the degree of annoyance for humans.

The two primary concerns with construction-induced vibration, the potential to damage a structure and the potential to interfere with the enjoyment of life are evaluated against different vibration limits. Studies have shown that the threshold of perception for average persons is in the range of 0.008 to 0.012 in/sec PPV. Human perception to vibration varies with the individual and is a function of physical setting and the type of vibration. Persons exposed to elevated ambient vibration levels, such as people in an urban environment, may tolerate a higher vibration level, whereas the opposite is true for people in rural areas.

Structural damage can be classified as cosmetic only, such as minor cracking of building elements, or may threaten the integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher and there is no general consensus as to what amount of vibration may pose a threat for structural damage to the building. Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

Existing Noise and Vibration Environment

Existing noise sources in the Project area are associated with agricultural operations on the eastern portion of the Project site and the Pacific Ocean along the western boundary of the Project site. Sources include waste pumps, irrigation equipment, diesel generators, forklifts, livestock trucks, milk conveyance trucks, semi-trucks, tractors, and other vehicles and equipment. Truck traffic along Project roadways is the primary source of local noise. However, due to the Project area's location away from US 101 and other major highways and roadways, time-averaged noise levels in most of the Project area are generally low. Due to the Project location along the coast, and on the Eel River delta, wind both elevates background noise levels, and can attenuate heavy equipment noise. There are no known existing vibration sources in the Project area.

Sensitive Receptors

Land uses that are generally sensitive to noise are residential areas, schools, convalescent and acute care hospitals, some parks and recreational areas, and churches and other religious facilities. The only sensitive receptors identified near the Project site are rural residences, of which there are only a few within a few hundred feet or more from the Project site.

3.12.2 Regulatory Framework

Federal

No federal standards related to noise and vibration would be applicable to the Project.

State

California state law recommends that development planning use CNEL or Ldn, which are considered to be equivalent for planning purposes, as the appropriate noise/land use compatibility criteria. The state has established guidelines for acceptable community noise levels to ensure that noise exposure is considered in any development, as shown in Table 3.12-2. CNEL-based standards apply to noise sources whose noise generation is preempted from local control (such as from on-road vehicles, trains, airplanes, etc.) and are used to make land use decisions as to the suitability of a given site for its intended use. These CNEL-based standards are provided in the *Noise Element of the Humboldt County General Plan*. Since local jurisdictions cannot regulate the noise generator, they exercise land use planning authority on the receiving property.

Table 3.12-2 California Land Use Compatibility Guidelines for Exterior Community Noise (Community Noise Exposure CNEL, dB)

Land Use	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential – Low Density Single Family, Duplex, Mobile Homes	Below 60	55-70	70-75	Above 75
Residential – Multi-Family Homes	Below 65	60-70	70-75	Above 75
Transient Lodging: Motels, Hotels	Below 65	60-70	70-80	Above 80
Schools, Libraries, Churches, Hospitals, Nursing Homes	Below 70	60-70	70-80	Above 80
Auditoriums, Concert Halls, Amphitheaters	-	Below 70	-	Above 65
Sports Arena, Outdoor Spectator Sports	-	Below 75	-	Above 70
Playgrounds, Neighborhood Parks	Below 70	-	67-75	Above 72.5
Golf Courses, Riding Stables, Water Recreation, Cemeteries	Below 75	-	70-80	Above 80
Office Buildings, Business Commercial and Professional	Below 70	67-77	Above 75	-
Industrial, Manufacturing, Utilities, Agriculture	Below 75	70-80	Above 75	-

Source: State of California Governor's Office of Planning and Research, General Plan Guidelines, 2003.

Notes:
Normally Acceptable: Specified land use is satisfactory based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
Conditionally Acceptable: New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning would normally suffice.
Normally Unacceptable: New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable: New construction or development should generally not be undertaken.

Regional and Local

Humboldt County General Plan: Noise Element Standards

According to the *Humboldt County General Plan*, "(t)he principal sources of noise in Humboldt County are highways, airports, rail, on-site construction, and industrial activities" (Section 3240). None of these sources are located in the Project area. The Project area is dominated by agricultural operations, with several small, rural residences nearby. Large industrial timber harvest operations, gravel mining operations, and creamery are found within 10 miles of the Project site.

The General Plan includes a Land Use/Noise compatibility matrix that is consistent with the state's Noise/Land Use Compatibility standards (Table 3.12-2, above, Section 3240, Humboldt County General Plan 1984). This matrix categorizes noise exposures by land uses, decibel ranges, and general acceptability.

Figure 3-2 of the *Humboldt County General Plan* (Volume I) indicates that, unlike residential areas, higher noise levels are "clearly acceptable" and "normally acceptable" in agricultural land use categories; for livestock farming, the "clearly acceptable" range is between 45 and 65 Ldn and the "normally acceptable" range is between 60 and 75 Ldn. Levels between 75 and 80 Ldn are "normally unacceptable," while levels higher than 80 Ldn are "always unacceptable." The *Humboldt County General Plan* stipulates that 65 dBA is the upper acceptable limit for residential units (outside measurement), and 75 dBA is the upper acceptable limit for agricultural activities involving livestock farming.

There are some rural residences to the east and south of the Project site potentially subject to higher Ldn standards than adjacent agricultural operations. A standard-construction wood-frame house reduces noise transmission by 15-20 dB. Since interior noise levels for residences are not to exceed 45dB, the maximum acceptable exterior noise level for residences is clearly acceptable at 60 dB without any additional insulation being required, and would be normally acceptable up to 65 dB. Acceptable noise levels as measured outside of a residential unit would vary depending on the land use designation, adjacent uses, distance to noise source, intervening topography, vegetation, and other buffers and factors that attenuate noise.

Humboldt County General Plan

The *Noise Element* of the *Humboldt County General Plan* sets forth policies related to noise and land use compatibility. The most applicable policy to the proposed Project is below.

5. Noise

C. The land use noise compatibility matrix (Figure 3-2) shall be utilized as the standard for General Planning and zoning purposes.

3.12.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to noise, as defined by the CEQA Guidelines (Appendix G), if it would:

- Result in 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;

  <u>Significance Threshold (Sources)</u>

  Humboldt County General Plan Figure 3-2 – Land Use/Noise Compatibility Standards

- Result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;

Significance Threshold (Sources)

0.3 in/sec PPV – cosmetic damage to structures – (Caltrans Transportation and Construction Vibration Guidance Manual)

- Result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project;

  Significance Threshold (Sources)

  Humboldt County General Plan Figure 3-2 – Land Use/Noise Compatibility Standards

- Result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project;

  Significance Threshold (Sources)

  Daytime - 60 dBA Leq and 5 dBA Leq or more above the ambient for a period greater than one year – (Standard industry practice)

- 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, and expose people residing or working in the Project area to excessive noise levels; or
- Located within the vicinity of a private airstrip, and expose people residing or working in the Project area to excessive noise levels.

Areas of No Project Impact

As explained below, the Project would not result in impacts related to two of the significance criteria identified in Appendix G of the current CEQA Guidelines. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **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, and expose people residing or working in the Project area to excessive noise levels?** The proposed Project is not located within an airport land use plan or within two miles of a public airport. Therefore this significance criterion is not applicable to the proposed Project and is not discussed further.
- **Located within the vicinity of a private airstrip, and expose people residing or working in the Project area to excessive noise levels?** The proposed Project is not located within the vicinity of a private airstrip. Therefore this significance criterion is not applicable to the proposed Project and is not discussed further.

3.12.4 Methodology

The noise and vibration impact assessment for this Project is evaluated in the context of Project implementation impacts (short term construction noise impacts), and Project maintenance and adaptive management (long term) for the Project area. For purposes of this discussion, short-term impacts assume a three-field-season construction period, with each season extending approximately 180 days between May and October. Upon completion, maintenance and adaptive management activities would cause occasional increases above background levels in various locations throughout the Project area.

For construction noise, the potential for impacts was assessed by considering several factors, including the proximity of Project-related noise sources to noise-sensitive land uses (i.e., sensitive receptors), typical noise levels associated with construction equipment, the potential for construction noise levels to interfere with daytime activities, and the duration that sensitive

receptors would be affected. For operational noise, the potential for impacts was assessed by evaluating the noise generation potential of noise sources, proximity of sensitive receptors, and the potential for operational noise to remain within the established local limits at the nearest receptors.

The Caltrans guidelines for vibration are the basis for the significance criteria for annoyance and potential building damage. Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards, 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern, and a conservative limit of 0.08 in/sec PPV for very old buildings or buildings that are documented to be structurally weakened. This analysis assumes that proposed construction areas would not be in the vicinity of fragile structures, but that older structures exist within the Project vicinity. Based on Caltrans guidance, this analysis establishes 0.3 in/sec PPV as the significance threshold for construction vibration to avoid damage to buildings from vibration sources.

3.12.5 Impacts and Mitigation Measures

Impact NOI-1: Would the Project result in 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.

As noted above, the *Humboldt County General Plan* stipulates that 65 dBA is the upper acceptable limit for residential units (outside measurement), and 75 dBA is the upper acceptable limit for agricultural activities involving livestock farming. Table 3.12-3 identifies average construction equipment noise for various construction equipment measured at 50 feet (dBA, L_{max}). Of the equipment listed in Table 3.12-3 the jackhammer has the highest noise level at 89 dBA (L_{max}) at 50 feet.

The Project area is primarily undeveloped with few residential homes. There are a few residences along Centerville Road and Russ Lane which are in relatively close proximity (within a few hundred of more) of the Project site's southern boundary; however, these distances are even greater to the proposed construction areas within the Project site (Figure 2-4). Sound from a point source is known to attenuate at a rate of -6 dB for each doubling of distance. For example, a noise level of 89 dBA (e.g., a jackhammer which is the loudest equipment listed in Table 3.12-3) as measured at 50 feet from the noise source would attenuate to 83 dBA at 100 feet from the source and to 77 feet at 200 feet from the source to the receptor. At the nearest sensitive receptor on Centerville Road, approximately 615 feet, the noise levels during construction and operation would be near or below the county's 65 dBA threshold limit for residential units (outside measurement). The impact would therefore be less than significant.

Table 3.12-3 Construction Equipment Noise Emission Reference Levels

Equipment Description	Actual Measured Lmax @ 50 feet (dBA) (Samples Averaged)
Backhoe	78
Bulldozer	85
Chain Saw	84
Compactor (ground)	83
Compressor (air)	78
Crane	81
Dozer	82
Drum Mixer	80
Dump Truck	76
Excavator	81
Flat Bed Truck	74
Front Bed Loader	79
Grader	85
Generator	81
Grapple (on backhoe)	87
Jackhammer	89
Pickup Truck	75
Pneumatic Tools	85
Roller	80
Scraper	84

Source: U.S. Department of Transportation, Federal Highway Administration, et al., *Construction Noise Handbook*, August, 2006.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact NOI-2: Would the Project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

Construction of the Project would include installation of new culverts and tidegates, the retrofit of existing tidegates, restoration of habitats, improved drainage, expansion of the tidal prism in the Inner Marsh, and suppression of invasive species. Major sources of groundborne vibration such as impact pile drivers are not proposed as part of the Project. Sheet piles may be placed as part of the final design of the tidegates and/or placed for temporary water control. If used, sheet piles would be advanced or pushed into the ground with an excavator using non-vibratory techniques.

Table 3.12-4 presents typical vibration levels that could be expected from construction equipment at a distance of 25 feet. As indicated in Table 3.12-4, vibration levels produced by a large bulldozer can reach 0.089 in/sec, PPV at a distance of 25 feet. Jackhammers typically generate vibration levels of 0.035 in/sec PPV at a distance of 25 feet. Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 3.12-4 Vibration Source Levels for Project Construction Equipment

Equipment	PPV at 25 ft. (in/sec)	Approximate Lv at 25 ft. (VdB)
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

Source: U.S. Department of Transportation, Federal Highway Administration, Construction Noise Handbook, 2006.

A review of the construction equipment list for the Project was made to identify the specific pieces of construction equipment that would result in the highest vibration levels at nearby receptors. A large bulldozer (or scraper or large excavator) would be used during the grading/excavation phase of the Project, and the nearest sensitive receptor would be located more than 600 feet from the nearest earthwork. At that distance vibration levels would be unnoticeable and well below the 0.3 in/sec PPV threshold used to avoid cosmetic damage to buildings that are found to be structurally sound but where structural damage is a major concern. Vibration levels produced by other equipment proposed as part of the Project and at locations further from receptors would also be well below the 0.3 in/sec PPV threshold. This would be a less-than-significant impact.

Vibration levels associated with the operation of tidegates and heavy equipment to relocate sediment would be similar to those levels described above for construction; therefore, vibration levels associated with operations would also be less-than-significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact NOI-3: Would the Project result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.

Operational activities associated with the Project include seasonal relocation of sediment in approved upland and agricultural locations, maintenance of access routes, and invasive species removal (using passive and active restoration techniques). Noise at the Project site during these activities would not measurably exceed the existing background noise levels because only infrequent vehicular access, minor repairs, and maintenance would be required. Additionally, there are no sensitive receptors within close proximity to these Project activity locations. A less than significant impact would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact NOI-4: Would the Project result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.

Temporary increases in sound and vibration levels at the Project site would occur during the construction period, which is approximately 180 days for years one through three. Construction would involve a significant amount of heavy equipment given the amount of earthwork. The Project has the potential to expose people offsite to objectionable sound if loud construction activities took place during sensitive night time hours, if people offsite were in close proximity to Project activities, or if improperly muffled machinery were operating. Otherwise, the temporary elevation of ambient sound and vibration levels would be limited, particularly given the distance to sensitive receptors (600 feet or more at the Project site boundary for the closest sensitive receptor).

Table 3.12-3 illustrates the noise levels produced by various types of construction equipment. Properly maintained equipment would produce noise levels close to the average. Activities such as channel excavation, enhancement of the freshwater ponds, dune creation, and offloading and placing sediment in agricultural areas would occur within the Project site. The types of construction equipment used for earthmoving typically generate noise levels between 70–90 dBA at a distance of 50 feet when the equipment is operating.

Construction equipment operations can vary from intermittent to fairly continuous use, with multiple pieces of equipment operating concurrently. A worst-case construction scenario (from a noise level perspective) may consist of concurrent operation of a bulldozer (85 dBA), a backhoe (78 dBA), a grader (85 dBA) and a front bed loader (79 dBA) in the same general area. Peak construction-period noise from this combination of equipment would exceed 85 dBA at the construction site. Episodes of noise levels greater than 60 dBA would occasionally occur at locations within approximately 1,600 feet of a construction site. As noted previously, there are a few residences along Centerville Road and Russ Lane which are in relatively close proximity (within a few hundred of more) of the Project site's southern boundary.

Although construction noise levels would exceed the 60 dBA Leq noise level threshold in the immediate Project vicinity, the impact from daytime construction noise over an approximate 180-day construction period (for years 1-3), is not considered substantial. The Impact would be less than significant recognizing the relatively short-duration of the proposed construction activities, the rural nature of the Project area, and the distance to sensitive receptors.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.12.6 Cumulative Impacts

Impact NOI-C-1: Would the Project result in a cumulatively considerable contribution to cumulative impacts from noise.

Noise impacts from the proposed Project would be short-term and highly localized during both construction and operations. A cumulative noise impact would only occur if noise sources from two (or more) projects occurred at the same time in the same general area, and if they contributed to an increase in ambient noise levels above county standards. Because there are no sensitive receptors in the Project vicinity, with the exception of a few rural residences several hundred feet to more than 1,000 feet from the Project site boundary, and there are no other cumulative projects in the vicinity, no cumulative noise impacts would result from implementation of the proposed Project.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.12.7 References

Federal Transit Administration, 2006, *Transit Noise and Vibration Impact Assessment*, United States Department of Transportation, Office of Planning and Environment, May.

Humboldt County, 1984, *Humboldt County General Plan, Volume I Framework Plan*.

U.S. Department of Transportation, Federal Highway Administration (U.S. DOT FHWA), 2006, *Construction Noise Handbook*, August.

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3.13 Population and Housing

This section evaluates the potential impacts related to population and housing with implementation of the Project. The Setting section describes the existing environmental setting as it relates to population and housing, and there are no federal, State or local regulations applicable to the Project. Since there are no population and housing impacts, this section does not include the methodology, impacts and mitigation measures, and cumulative impacts sections.

3.13.1 Setting

The closest population area to the Project site is the City of Ferndale where there are combinations of industrial, commercial and residential uses. The City of Ferndale had an estimated population of 1,456 people in 2014 (U.S. Census Bureau 2014) occupying 696 households. Rural residences and ancillary uses exist along all the county roads adjacent to the Project site.

Proposed Features

None related to the Project.

3.13.2 Regulatory Framework

There are no federal, State, or local regulations that apply to the proposed Project related to population and housing resources in Humboldt County.

3.13.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would be considered to have a significant impact on population and housing if it would result in any of the following:

- Induce substantial population growth in the area, either directly (by proposing new homes and businesses) or indirectly (through the extension of roads or other infrastructure);
- Displace substantial numbers of existing housing; or
- Displace substantial numbers of people.

Areas of No Project Impact

Construction and operation of the Project would not result in impacts related to all three of the significance criterion identified in Appendix G of the current CEQA Guidelines; therefore the following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Induce substantial population growth in the area, either directly (by proposing new homes and businesses) or indirectly (through the extension of roads or other infrastructure).** The Project includes the restoration of ecosystem functions within the Project area, to enhance habitats for native fisheries and aquatic species, support waterfowl and wildlife species, and to enhance agricultural productivity by decreasing and more effectively managing onsite flooding. No aspect of the Project would induce substantial population growth; therefore, this significance criterion is not applicable to the Project and is not discussed further.
- **Displace substantial numbers of existing housing or people, necessitating the construction of replacement housing elsewhere.** There are no houses on the Project site or people living on the Project site; therefore, this significance criterion is not applicable to the Project and is not discussed further.

3.13.4 References

U.S. Census Bureau, 2014, *2010-2014 American Community Survey 5-Year Estimates* for the City of Ferndale, California.

3.14 Public Services and Utilities

This section evaluates the potential impacts related to public services and utilities and service systems during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the existing public services and utilities in the Project area and the regulatory framework section describes applicable federal, state and local regulations, policies and programs. Public services discussed in this section include fire protection, law enforcement, schools, parks, and other public facilities. Utilities discussed in this section include water, wastewater, storm drainage, solid waste, electricity and natural gas, and communications. The evaluation section establishes the thresholds of significance and evaluates potential public services and utilities impacts.

3.14.1 Setting

Public Services

Fire Protection

Founded in 1897, the Ferndale Volunteer Fire Department (FVFD) is responsible for the preservation and protection of life and property for the City of Ferndale and the surrounding rural area. The Ferndale Fire Protection District (FFPD) is a special district responsible for providing fire protection services, through the FVFD, to the City of Ferndale and the unincorporated communities of Grizzly Bluff, Arlynda Corners, Centerville, Port Kenyon, Wildcat Ridge, and the remainder of the Eel River bottoms south of the Eel River.

The active powers of the FFPD include structural fire protection and suppression, rescue, and emergency medical services. Latent powers include water supply and storage for fire suppression purposes. While the FFPD is responsible for structural fire protection and emergency medical responses, California Department of Forestry and Fire Protection (CAL FIRE) retains responsibility for grass and forest fires. The FFPD has joint responsibility for grass and forest fires within the District through a mutual aid agreement with the CAL FIRE. The FFPD also has mutual aid agreements with the Loleta and Fortuna Fire Protection Districts. These mutual aid agreements allow the districts to enter into agreements for services, including emergencies which have the potential to overwhelm the resource capabilities within a single district. This enables the FFPD to maintain preparedness for a disaster beyond their capacity, without the need to expand and create an additional facility.

The FFPD has a district boundary of 44 square miles and a total response area of 115 square miles. The District's current boundaries encompass the area from the Pacific Ocean on the west to the Eel River on the north and east, and to Upper Bear River Road on the southern border. The FVFD has one rescue truck, three fire engines (pumpers), two water tenders, a utility truck and other assorted equipment. The Department also has 12 volunteers trained for Firefighter 1 and Wildland fires, four first responders, 10 Emergency Medical Technicians, and four volunteers trained for Hazardous Materials (Planwest 2013).

Law Enforcement Services

The Humboldt County Sheriff's Office provides a variety of public safety services countywide (court and corrections services) and law enforcement services for the unincorporated areas of the county. The California Highway Patrol is responsible for enforcing traffic laws on roadways within the unincorporated areas and on state highways throughout the county.

The Sheriff's Office Operations Bureau is made up of seven units under the command of the Undersheriff. The most visible of these units is the Patrol Unit. Sheriff's Deputies assigned to the Patrol Unit are responsible for responding to emergency calls for service, criminal investigations, and crime prevention through neighborhood and beat patrols. Patrol has one main station in Eureka, substations in Garberville, Hoopa and McKinleyville, and six resident deputy posts.

The Sheriff's Office has mutual aid agreements with cities and the California State Highway Patrol. Mutual aid is an agreement between agencies where the agency of jurisdiction can request manpower or resources from allied agencies or agencies within the surrounding areas. These agencies could be local or state agencies.

According to the *Humboldt County General Plan Update Draft EIR*, the Project area has a maximum response time of 30 minutes. In the more rural areas of the county, like the Project area, maximum response times may reach 50 minutes because of longer travel distances, varied topography, available resources, and the location of the Sheriff Deputy on patrol in relation to the incident (Humboldt County 2012).

Public Schools

The Project site is located within the Ferndale Unified School District. School age persons in the Project area requiring public schooling from kindergarten through eighth grade attend Ferndale Elementary School, located at 164 Shaw Avenue in Ferndale. Public high school students attend Ferndale High School, located at 1231 Main Street in Ferndale. There are no school age persons residing in the Project site.

Parks

The Project area is undeveloped for recreational use, although, passive recreation use currently occurs on the EREP portion of the Project. Russ Park and Fireman's Park in the Francis Creek watershed provide hiking trails and public parking facilities.

Utilities and Service Systems

Water Supply

No water companies or districts provide water to the Project site. The Project site and surrounding rural areas are served by private wells. There are three artesian wells on the Project site that provide fresh water.

Wastewater Treatment and Disposal

The Project site does not include any wastewater treatment and disposal facilities. The Potato Barn has a portable vault toilet, and there are no additional wastewater or septic systems on the Project site. Wastewater treatment in most of the surrounding area is provided by private septic systems.

Storm Drainage

The Project area includes a number of drainage ditches which enable multiple land managers to operate successful agricultural operations on what was historically tidal marsh. Since the area generally declines in elevation as one moves from south to north, drainage moves roughly northward across numerous properties. The mutual inter-dependence of landowners in the Project area upon this infrastructure is formally expressed in a drainage easement. The drainage easement was recorded October 20, 2008, shortly after the purchase of the Connick Ranch by TWC. In general, this easement allows the grantees to enter and perform certain drainage maintenance functions on the EREP and ORF property, to the extent that these are legally permissible. Key actions include removal of sand and sediment from the Western Drainage Ditch when it becomes clogged, and maintenance of the Cut-Off Slough tidegate and perimeter dike in

order to facilitate drainage when conditions in the Eel River estuary permit and as environmental regulations allow.

Solid Waste Collection and Disposal

Eel River Resource Recovery provides solid waste collection in the Project area and their main facilities are located in Fortuna. Also in Fortuna is the Smith Lane Recycling Center and their transfer station is in Redway.

Electricity and Natural Gas

PG&E supplies power to the Potato Barn, Quonset Hut, and a well on the Project site. No natural gas pipeline system exists in the Project area.

Communications

Frontier Communications provides basic and long-distance telephone, dial-up internet and DSL service in the Project area. Suddenlink provides cable television and cable internet service. Cellular telephone service and satellite television are available from a variety of companies.

3.14.2 Regulatory Framework

Federal

There are no federal regulations governing public services that apply to the Project.

State

There are no state regulations governing public services that apply to the Project.

Regional and Local

Humboldt County General Plan Goals and Policies

The following policy from the *Humboldt County General Plan* is applicable to the Project.

4720 Policies

1. Proposed development shall be adequately serviced by water supplies for fire protection or shall have a letter from an appropriate fire protection agency indicating that adequate fire protection can be provided.

3.14.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would be considered to have a significant impact on public services and utilities and service systems if it would result in any of the following:

- Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection, police protection, schools, parks, and/or other public facilities;
- Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;
- 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;

- 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;
- Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed;
- 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;
- Be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs; or
- Comply with federal, state, and local statutes and regulations related to solid waste.

Areas of No Project Impact

The Project would not result in impacts related to four of the evaluation criteria identified in Appendix G of the current CEQA Guidelines. For the reasons presented below, the following evaluation criteria are not applicable to the Project.

- **Would the Project have substantial adverse impacts to schools, parks, and/or other public facilities?** The Project would not result in an increase in population and therefore would not create a need for new schools or increase any school population. The Project would not affect school funding. The Project would have no effect on recreational facilities in the vicinity. Therefore, the proposed Project would have no impact to schools, parks or other public facilities.
- **Would the Project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board or 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?** The Project would not include any wastewater or water facilities and would not create additional wastewater or water need. Therefore, the Project would have no effect on wastewater and water and these issues are not discussed further.
- **Would the Project 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?** The Project would not create any new impervious surfaces or structures. The Project would enhance the Project area by transitioning it from a landscape of mostly diked pasture land to a system of pastures and natural habitats including estuarine and tidal slough channels, freshwater streams, freshwater waterfowl ponds, and agricultural pastures. Therefore, the Project would have no effect on storm water drainage facilities and this issue is not discussed further.
- **Would the Project be served by a landfill with sufficient permitted capacity to accommodate the Project's solid waste disposal needs and comply with federal, state, and local statutes and regulations related to solid waste?** The Project would generate only a minimal amount of solid waste during construction and would not generate solid waste after implementation. Solid waste would be sent to an approved landfill in the disposal area. Therefore, the Project would have no effect on landfill capacity and compliance with regulations related to solid waste and these issues are not discussed further.

3.14.4 Methodology

Potential impacts to public services are evaluated for construction and operational activities. The evaluation considers whether the Project would affect the county's existing public services, including fire protection and law enforcement, by affecting the current service ratios/response times.

3.14.5 Impacts and Mitigation Measures

Impact: PS-1: Would the Project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the 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 fire protection and police protection.

Fire Protection and Emergency Medical Services

The Project would not increase population, therefore, it is not anticipated that the Project would increase the need for fire protection or emergency medical services, or affect service ratios or response times of these public services. The fire hazard at the site is low because a good portion of the Project area is open pasture and/or agricultural wetlands kept moist by summer fog, periodic precipitation and irrigation. The Project would reduce fire hazard by restoring an open channel in the Western Drainage Ditch and Russ Creek, which would serve as a firebreak. Limited public access would be provided by a trail and boardwalk to the dune overlook area, and kayak put in and take out locations. The impact would be less than significant.

Refer to Section 3.16 (Transportation), for an evaluation of impacts to emergency access.

Law Enforcement Services

The Project area is patrolled by the Humboldt County Sheriff's Office. The majority of the Project site is currently not regularly used by the public, although, limited recreational use does occur on the EREP portion of the Project, and is not anticipated to increase significantly over current levels. County roads in the Project area are used by local walkers, joggers, and horseback riders. Public access to the Project site would be via Centerville Road to Russ Lane. The Project would not substantially increase use or access or increase the area needing regular patrol by the Humboldt County Sheriff's Office. Additional patrol would not be required. The impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.14.6 Cumulative Impacts

Impact: PS-C-1: Would the Project result in a cumulatively considerable contribution to cumulative impacts related to public services.

Impacts associated with the proposed Project are primarily short-term, construction-related impacts, and specific to a particular location and time. However, ongoing maintenance and monitoring activities may include vegetation removal, ongoing riparian planting and/or repeated excavation or reworking of deposited sediments. Construction and operational activities would neither contribute to nor cause a significant cumulative impact since the Project's impacts are less

than significant, and it is unlikely that other projects would impact the same public services at the same time during the construction window. Therefore, the proposed Project would not contribute to a significant cumulative impact relative to public services.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.14.7 References

Humboldt County, 2012, *Humboldt County General Plan Update Draft Environmental Impact Report*, April 2.

Planwest Partners, Inc., 2013, *City of Ferndale Safety Element*, April.

3.15 Recreation

This section evaluates the potential impacts related to recreation during construction and operation of the Project. To provide the basis for this evaluation, the Setting section describes the physical context. Descriptions in this section are based on a variety of sources including traffic records, visitation logs, historic accounts and interviews. The Regulatory Framework section describes the applicable federal, state and local regulations affecting the Project area and the proposed Project. The evaluation criteria, impacts, and mitigation measures sections establish the thresholds of significance, evaluate potential recreational impacts, and identify the significance of impacts and feasible mitigation measures if necessary.

3.15.1 Setting

Physical Context

The Project area encompasses 1,838-acres owned by The Wildlands Conservancy (TWC – 1,237-acres,) and Russ Ranch and Timber, L.L.C. (RR&T) and Jack and Linda Russ (Russ family – 601-acres). Together this area of land extends from the mouth of the Eel River south to Centerville Road and the base of the Wildcat Hills. Centerville County Park beach is at the southwestern edge of the Project area. Centerville Road is the southern boundary of the Project area.

The 1,200-acre EREP was historically part of the original Occidental Ranch, then the Connick Ranch. The 601-acre Russ family property is a combination of the original Moranda Dairy and the surrounding town of Centerville.

Much of the EREP was known as the “Occidental Marsh,” and for good reason; this section of the historic Occidental Ranch was criss-crossed by a navigable Centerville Slough and a vast network of channels, terminal ponds and wetlands that lent itself more reliably to boat travel than any other mode of transportation. Centerville Slough extended south through the entire Project area to the historic town and port of Centerville, which lay at the base of the Wildcat Hills near Centerville County Park.

The Project is located on contiguous private parcels, some of which are managed solely for agricultural production, and some of which have historically been managed for combined agricultural production and recreational use. During its incarnation as the Connick Ranch, EREP was managed for a combination of agricultural use and private recreational use, including duck hunting and equestrian use. Since 2008, the EREP has been managed for combined agricultural production, outdoor education and general recreational use. All parcels have experienced more than a century of management for intensive agricultural production and livestock grazing. Impacts to the land have included construction of dikes, bridges and roads, barns, fences and other infrastructure as well as infilling and re-routing of creeks and waterways, reclamation of hundreds of acres of tideland, conversion of landforms and more.

Historic access to the Project area occurred in early years via the dunes, then later via Port Kenyon Road, through historic Occidental Ranch, now the O’Rourke Foundation Property. By the 1920s access to the Project area occurred primarily via Russ Lane or Centerville Road. Russ Lane is now the primary access to the EREP and parts of RR&T. Russ Lane is 0.5 mile in length. The first four-tenths of a mile leaving Centerville Road is a County owned and maintained public road designated in County records as Road 2G020. The last 500 feet of the road is not maintained by the County, but appears to be part of the County road, though this is disputed. TWC owns a 26-foot wide easement over the last 500-feet of Russ Lane encumbering APN 100-142-002, a parcel owned by

Harville Ranch L.L.C., a property co-owned by members of the Russ family. After 0.5 mile, Russ Lane ends at TWC's 66-foot easement encumbering the northerly 66-feet of APN 100-142-002.

Access to RR&T or Jack and Linda Russ property is achieved either via Centerville Road or Russ Lane. Those properties are solely managed for agricultural operations, and no public access is allowed. Some trespass, primarily OHV use, and minor duck hunting, occurs via Centerville Beach.

One particular physical setting condition in combination with differing land use emphases has generated discussions between the Russ family and TWC since the TWC acquired The Connick Ranch in 2008. At the center of this disagreement is a debate about public access generally, and more specifically whether the access to TWC's property for recreational/public access purposes is overburdening the existing easement described above over APN 100-142-002, owned by Harville Ranch L.L.C., an L.L.C. owned by Russ family members who also own an interest in RR&T, L.L.C, which is part of the proposed Project.

In simplest terms, TWC asserts that the easement over Harville Ranch L.L.C. to EREP is unrestricted. In contrast, Russ family members co-owning Harville Ranch, L.L.C. assert that the easement is an agricultural easement that does not permit the public access practiced by TWC at EREP and TWC's other properties. TWC asserts that the property can be made available to the public for educational and recreational purposes, and Russ and Harville assert that it is suitable only for "scheduled invited guests."

The existing dispute is important, and awaits resolution; however, it is irrelevant to the physical setting and potential recreational impacts of the proposed Project for a variety of reasons. First, both TWC and RR&T, the surrounding landowner, support the proposed Project, and have set aside this difference of opinion in order to advance more important and mutually beneficial Project features. Second, there appears to be no assertion that implementation of this Project that is primarily an ecosystem restoration and agricultural enhancement project would have any adverse recreational impact on the surrounding area. Third, TWC has voluntarily agreed to a self-imposed restriction on the level of access to the EREP. Regardless of whichever view of the disputed easement prevails, the proposed Project can be designed and built with no adverse recreational impacts to the environment related to this dispute. Therefore, this dispute is acknowledged, but it is not considered in this analysis below.

Existing Recreational Features

The sole use of RR&T land and Jack and Linda Russ property is agricultural production; recreation is prohibited there.

The Connick Ranch was acquired by TWC in 2008. At the time of acquisition, the property had been leased by the former owner, Tom Connick, to RR&T for decades of livestock grazing. TWC inherited the management of this lease with the property, and continued managing it from 2008 to 2012. In 2012, that lease was mutually terminated, and a new lease was let with Robert and Tim Miranda.

Duck hunting is extremely popular in the Eel River Delta, and has been since the nineteenth century. The Occidental marsh was particularly popular with area residents. Beginning at least as early as 1939 the Connick family held a lease with the Centerville Gun Club (CGC), and public hunting was thereafter discouraged. Early resident John Rusk recalled being appointed a "deputy sheriff on the marsh to keep the poachers from getting the ducks ahead of the gun club hunters…(t)he Occidental marsh was rented to the gun club." The Eel River Gun Club (ERGC), a separate entity, took over the lease in 1954. In 2015 the ERGC changed their name to the Eel River Waterfowl Association (ERWA). The ERGC/ERWA leases 40 acres on the EREP. A strong

public desire to regain access to the Occidental Marsh for waterfowl hunting was expressed in the initial scoping of the Project.

In addition to TWC's maintenance of the ERWA hunting lease, TWC encourages non-consumptive recreation on the EREP. The site is popular with bird watchers, hikers and equestrians. TWC hosts members of the local Audubon chapter for their Christmas bird count, and the observation list indicates high biodiversity.

Like Centerville Beach County Park, just south of the Project site, visitation to the EREP is low, possibly due to its novelty or lack of advertisement, but more likely due to its isolation. Overall visitation to the EREP since acquisition has been documented and includes members of the ERGC, school groups, birders, equestrians and other guests. Visitation appears to hold steady at an annual average of approximately 511 visitors per year, an estimated 70 percent of whom are ERGC members.[1] Table 3.15-1, below, summarizes the level and type of usage at the EREP since 2008. The "Other" category includes weekend and weekday visitors, researchers and TWC volunteers.

Visitation tends to be seasonal or confined to specific events. For instance, the Audubon Christmas Bird Count attracts some of the "birders," on Christmas day. On rare instances, the arrival of a rare species can attract avid birders from far afield, such as the occasion when a gyrfalcon brought 200 visitors to the Project area in a day. Similarly, ERGC visitation is confined largely to the hunting season, with the exception of work parties or maintenance visits.

"Visits" by agricultural lessees, deliveries, ranger travel on and off the EREP, consultant travel in the course of Project development and so forth has not been counted and is considered insignificant.

For purposes of comparison to visitation and recreation in other areas, the Humboldt Bay National Wildlife Refuge (Refuge) in Loleta, conveniently located adjacent to Highway 101, averages approximately 20,000 visitors per year for the entire complex, and approximately 12,825 for the visitor center in Loleta, alone. The complex includes the Salmon Creek, Hookton Slough, and Dunes Units. The USFWS utilizes direct counts, remote trail counters, car counts from photos and reports from partner organizations such as Friends of the Dunes to arrive at their visitation estimates. Daily logs were not available, but assuming seasonal variations, with peak visitation in summer, and possible monthly visits of 1,500/month, the maximum daily visitation possibly ranges from 50-100 visitors during peak periods and weekends.

The difference between visitation at EREP and the Refuge is likely due to the proximity of the Refuge to heavily travelled Highway 101, and the relative distance of the EREP from a major thoroughfare. A detour to the EREP from Highway 101 would require the average tourist at least half a day, including 1 hour in travel time.

[1] ERGC/ERWA visitation is an estimate based upon a high of 10 hunter members, three days/week during the three month regular season, plus a one month extended goose season combined with a low of half that, then averaged. It is probably that visitation levels depend upon weather, hunting conditions, personal schedules and other factors. These visitation numbers do not include ERGC work parties, blind preparation and so forth.

Table 3.15-1 EREP Visitation Levels

Year	Duck Club	Students	Birders	Other Recreation	Total
2008	360	10	33	40	443
2009	360	30	5	10	405
2010	360	30	20	20	430
2011	360	10	7	40	417
2012	360	30	20	63	473
2013	360	25	40	17	442
2014	360	85	200*	100**	745
2015	260***	249	64	162	735
2016****	60	0	0	72	132

Notes: *A rare gyrfalcon was observed on or near TWC property in 2014 causing an extensive and unforeseen level of visitation, and congestion, to the Project area for one day.
** The Fish Passage Forum hosted a special meeting and tour focused on the Eel River Delta in November 2014, resulting in a one-day peak in visitation to the Ferndale area.
*** El Nino conditions, or perhaps migratory patterns, resulted in a poor hunting season on the EREP, hence the lower estimated visitation.
**** 2016 values are not complete and are not factored into average visitation calculations.

The primary recreation use at the EREP as measured by visitation levels and impacts to the land (such as construction and improvement of ponds) is duck hunting. Secondary uses at the EREP include walking, horseback riding, and passive observation of wildlife. Public access is not a component of land management on the Russ family portion of the proposed Project.

Other public recreation facilities or access points in the Eel River Delta include (on the north side of the Eel River) Crab Park, Pedrazzini Boat Launch, Cannibal Island and Camp Weott Road. On the South side of the Eel River recreation points include Centerville County Park, Guthrie Creek, Fleener Creek, and Lost Coast Headlands.

Traffic patterns along Centerville Road are relatively light, suggesting low usage of the area. Between 2008 and 2010, traffic also declined significantly, although 2008 values are from October and 2010 values are from June. Hence, the 100 percent decline on many days may simply be a seasonal pattern. The patterns do, however, show a strong increase in westbound traffic beyond Centerville County Park on Fridays and Saturdays, and a corresponding increase in eastbound traffic on Sundays and Mondays. These travelers undoubtedly include some number of visitors to nearby parks such as Guthrie Creek, Fleener Creek or the Lost Coast Headlands, but none of these areas are known to offer the overnight accommodation implied by the travel patterns. These overnight, weekend commute-like patterns suggest that the majority of drivers on Centerville Road are not travelling for work, and are not recreating locally, but appear to bypass the Project area entirely, heading instead towards spots beyond Centerville Beach. These visitors may be travelling to overnight stays in the Mattole River Valley, where there are many vacation cabins. Alternatively, the directional patterns and seasonal variation may be attributable to cannabis cultivation in the area.

Centerville Beach County Park, the nearest recreational facility, and a prominent local feature, is a modestly used but much appreciated destination for beachcombers, surf fishermen, driftwood harvesters, equestrians and OHV users. Set at the base of the Wildcat Hills just north of Cape Mendocino, its scenic beauty highlights the dramatic scenery and sense of remoteness of the Lost Coast and Eel River Delta. Visitation is estimated at 10-30 visitors per day on weekends, although this value varies seasonally.

OHV access at Centerville Beach County Park is popular. OHV use is heavily restricted or prohibited at beaches elsewhere in the County due to federal requirements to protect Western Snowy Plover habitat. Western Snowy Plovers are found in the Project area near Centerville Beach County Park, but no restrictions on OHV use have been adopted by the County for the area. TWC advises limiting OHV use on the dunes on RR&T and the County beach and has reduced OHV use on EREP significantly.

In issuing their Coastal Development Permit for the Salt River Ecosystem Restoration Project, the Coastal Commission sought limited public access at nearby Riverside Ranch. However, due to CDFW's concerns about management limitations, the Coastal Commission limited their condition of opening Riverside Ranch to at least two days per week for three seasons per year (i.e. about 20 percent of the calendar year). The Coastal Commission did require that a Public Access Plan be completed by the Humboldt Resource Conservation District (RCD) no later than November 2015. That plan is in development. In the meantime, the Salt River Watershed Council (SRWC) and RCD intend to provide public access at the former Toste Parcel, a 22-acre property purchased by the SRWC for the purpose of helping to implement the Salt River Ecosystem Restoration Project.

Since implementation of Phase I of the Salt River Ecosystem Restoration Project, boat access to Riverside Ranch resumed for the first time in decades. Boaters, mostly duck hunters, appeared to have travelled up the newly restored Salt River Channel to recently inundated Riverside Ranch in order to enjoy new hunting opportunities. Duck season typically extends from late October through January. Usage appears to be light.

Proposed Recreational Features

TWC's goal is to manage the EREP for agricultural production, outdoor education, recreation and habitat enhancement, and they defer extensively to their lessee for input on achieving the full economic potential of the property, consistent with this goal. TWC's current policy is to maintain agricultural operations on the EREP, while also inviting guests to "enjoy the beauty and wonder of nature," as expressed in their mission statement.

TWC's intention is that visitor access is allowed during both weekend days and one day midweek for passive recreational activities such as equestrian use, hiking, nature viewing, biking, kayaking and beach access between the hours of 8am to 5pm or 9am to 6pm, and while TWC staff is on-duty at the EREP. Visitor access at other times during the week would be limited to one day per week and be oriented towards the education of school children about nature, wetlands, estuary systems and agriculture as practiced in the Coastal Zone. This visitation would occur primarily via school bus/field trips. This education component of the access would include giving one week's notice to adjacent landowners prior to each said visit.

The proposed Project includes several features that either exist or are proposed for modification or installation consistent with TWC's agricultural operations and outdoor education mission.

Duck Club

The ERWA lease incorporates 40-acres of the 128-acre Duck Club Pasture. Infrastructure and drainage maintenance concerns expressed by members of the ERWA in recent years have prompted TWC to reduce grazing in that pasture in order to protect existing berms and infrastructure associated with the club and drainage in the area, but hunting has not declined significantly. However, the freshwater pond conditions have deteriorated from the perspective of the ERWA, and both they and TWC propose to enhance the existing freshwater ponds in order to improve hunting conditions for club members. ERWA use will continue to operate for the foreseeable future much as it has for more than a century.

North Barn

The North Barn lies at the end of a road atop a raised berm on a 32-acre pasture that is predominantly dune. An existing parking area at the barn, as well as multiple spur trails into and through the dunes, have prompted TWC to propose improvements to the access road to the barn, trails, and an interpretive area inside the barn. The rationale for this proposal is to ensure continued access to the North Barn for agricultural purposes, to conduct dune restoration throughout the area, and to focus trail use on one area to be served by a short boardwalk leading from the parking area over the dunes. Additional amenities may include interpretive panels near the parking area, a vault toilet at the barn, and interpretive panels depicting cultural, ecological and agricultural information inside the barn. Some reinforcement of the barn may be necessary for utility and public safety reasons. Due to the proposed excavation of Centerville Slough, a new bridge over Centerville Slough would be required to access this area safely for continued agricultural use and for recreational opportunities.

Inner Marsh Kayak Facilities

TWC proposes to install two kayak put in/take out facilities (reference Figure 2-4) to facilitate post-Project monitoring of the area, and to provide a recreational amenity for visitors. One is located at the proposed bridge over Centerville Slough, and the second is located outboard of the Cutoff Slough Tidegate. Use is essential to conduct post Project monitoring. Recreational use is anticipated to be fairly light and largely isolated from surrounding areas.

Public Access Plan

As described under “Physical Context,” above, the nature and level of use at the EREP remains a contested topic. As also indicated above, the disputed easement is irrelevant to this Project with regard to CEQA analysis. However, members of the Russ family do dispute other aspects of TWC’s land management of the EREP, particularly regarding the nature and level of recreational use at the EREP, and potential traffic level impacts and various impacts to adjacent livestock and livestock operations. The SCC attempted to resolve this dispute through facilitated meetings held in 2013. These discussions culminated in a Public Access Plan (“Plan”) for the EREP, released September 17, 2013.

The Plan defined “public access” as visitation by uninvited and unguided guests during normal business hours. Subsequently, in discussions with the Russ family and Project team members, TWC voluntarily limited hours of operation to weekends and one weekday, with a midweek day dedicated for visitation by school groups, with one week notice to adjacent property owners on school group days. The Plan contained a number of measures intended to avoid or ameliorate any possible conflicts between visitors to the EREP and surrounding agricultural uses. These measures ranged from TWC’s standard rules and regulations (dogs on leash, no fires, etc.) to fencing, gating, vegetation screens and accommodations for livestock movements by adjacent property owners.

TWC intends to adopt this plan, as further limited by their proposed visitation schedule, regardless of the proposed Project. Hence, it is outlined here to provide context, but is not further analysed as part of the proposed Project.

3.15.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project related to recreational resources in Humboldt County.

State

California Resources Agency Policies

California Department of Conservation

The California Department of Conservation administers and supports a number of highly successful programs, including the Williamson Act, the California Farmland Conservancy Program, the Williamson Act Easement Exchange Program, and the Farmland Mapping and Monitoring Program. These programs are designed to preserve agricultural land and provide data on conversion of agricultural land to urban use. The Department of Conservation is responsible for approving Williamson Act Easement Exchange Program agreements.

Williamson Act

The California Land Conservation Act of 1965, commonly referred to as the Williamson Act, has been the State's primary agricultural land protection program since its enactment. It is a non-mandated state program administered by counties and cities to preserve agricultural land and discourage the premature conversion of agricultural land to urban uses. The act authorizes local governments and property owners to (voluntarily) enter into contracts to commit agricultural land to specified uses for 10 or more years. Once restricted, the land is valued for taxation based on its agricultural income rather than unrestricted market value, resulting in a lower tax rate for owners. In return, the owners guarantee that these properties remain under agricultural production for an initial 10-year period. The contract is renewed automatically unless the owner files a notice of nonrenewal, thereby maintaining a constant 10-year contract. Currently, approximately 70 percent of the state's prime agricultural land is protected under this act. Participation is on a voluntary basis by both landowners and local governments and is implemented through the establishment of agricultural preserves and the execution of Williamson Act contracts.

Termination of a Williamson Act contract through the nonrenewal process is the preferred method to remove the enforceable restriction of the contract. Cancellation is reserved for unusual situations. In order to approve tentative cancellation, a board or council must make specific findings based on substantial evidence that a cancellation is consistent with the purposes of the act or in the public interest.

Recreational use is an accepted and compatible use of land contracted under the Williamson Act. By definition, an "agricultural preserve" "means an area devoted to either agricultural use, as defined in subdivision (b), recreational use as defined in subdivision (n), or open-space use as defined in subdivision (o), or any combination of those uses and which is established in accordance with the provisions of this chapter." (Public Resources Code § 51201 (d))

California Coastal Act

The Project area is within the Coastal Zone. The California Coastal Act contains numerous policies relevant to recreation, particularly in relation to allowable uses of diking, filling, or dredging of open coastal waters, wetlands, estuaries and lakes. The following Coastal Act sections are germane to this analysis:

Public Resources Code § 30210

In carrying out the requirement of Section 4 of Article X of the California Constitution, maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resource areas from overuse.

Public Resources Code § 30211

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Public Resources Code § 30212

a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or (3) agriculture would be adversely affected. Dedicated accessways shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

Public Resources Code § 30213

Lower cost visitor and recreational facilities shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

The commission shall not: (1) require that overnight room rentals be fixed at an amount certain for any privately owned and operated hotel, motel, or other similar visitor-serving facility located on either public or private lands; or (2) establish or approve any method for the identification of low or moderate income persons for the purpose of determining eligibility for overnight room rentals in any such facilities.

Public Resources Code § 30214

(a) The public access policies of this article shall be implemented in a manner that takes into account the need to regulate the time, place, and manner of public access depending on the facts and circumstances in each case including, but not limited to, the following: (1) Topographic and geologic site characteristics. (2) The capacity of the site to sustain use and at what level of intensity. (3) The appropriateness of limiting public access to the right to pass and repass depending on such factors as the fragility of the natural resources in the area and the proximity of the access area to adjacent residential uses. (4) The need to provide for the management of access areas so as to protect the privacy of adjacent property owners and to protect the aesthetic values of the area by providing for the collection of litter. (b) It is the intent of the Legislature that the public access policies of this article be carried out in a reasonable manner that considers the equities and that balances the rights of the individual property owner with the public's

constitutional right of access pursuant to Section 4 of Article X of the California Constitution. Nothing in this section or any amendment thereto shall be construed as a limitation on the rights guaranteed to the public under Section 4 of Article X of the California Constitution. (c) In carrying out the public access policies of this article, the commission and any other responsible public agency shall consider and encourage the utilization of innovative access management techniques, including, but not limited to, agreements with private organizations which would minimize management costs and encourage the use of volunteer programs.

Public Resources Code § 30233

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

(3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.

(4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of structural pilings for public recreational piers that provide public access and recreational opportunities.

(7) Restoration purposes.

(8) Nature study, aquaculture, or similar resource dependent activities.

(c) In addition to the other provisions of this section, diking, filling, or dredging in existing estuaries shall maintain or enhance the functional capacity of the wetland or estuary. Any alteration of coastal wetlands identified by the Department of Fish and Game, including, but not limited to, the 19 coastal wetlands identified in its report entitled, "Acquisition Priorities for the Coastal Wetlands of California", shall be limited to very minor incidental public facilities, restorative measures, nature study, commercial fishing facilities in Bodega Bay, and development in already developed parts of south San Diego Bay, if otherwise in accordance with this division.

Public Resources Code § 30240

(a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be compatible with the continuance of those habitat and recreation areas.

Regional and Local: Humboldt County

County Administration of the Williamson Act

Humboldt County Board of Supervisors (Board) first adopted guidelines for the Williamson Act locally on June 24, 1969. The Board, in June of 2002, adopted the first comprehensive update to the local Guidelines since 1978 to reflect major changes to the Williamson Act, including the 1998 adoption of Government Code Section 51296, otherwise known as the Farmland Security Zone (FSZ). The FSZ allowed property owners enrolled in this program to have the option of extended contracts, from 10 years to a 20-year term, and in exchange, receive an additional 35 percent tax reduction. The FSZ is designed for prime lands or lands designated on the Important Farmland Series Maps, and applies to lands lying within three miles of the adopted Sphere of Influence of incorporated cities. The Board's most recent update to the guidelines was in 2005. The County procedures for establishing an agricultural preserve were revised August 1, 2006. These explain the classifications of preserves.

From 1972 to 1981, nearly 243,000 acres were put under Williamson Act contracts in the County. In 2001 there were just over 273,000 acres in the program (in 145 established preserves), indicating that participation had not significantly increased over 20 years between 1981 and 2001.

Humboldt County General Plan

Most of the EREP is zoned AE-60/W, F, R, T. The exception is Centerville and Cutoff sloughs, which are zoned NR/R.

Conditionally permitted uses of parcels zoned AE include natural resource uses, such as wetland restoration and fish and wildlife habitat management. Within areas defined as "wetlands" only resource dependent uses such as nature study are permitted; those areas show land use designations of Natural Resources (NR).

Eel River Area Plan

The proposed Project is in the Coastal Zone, and the County of Humboldt administers the Coastal Act in the Project area via the LCP Eel River Area Plan (ERAP). The ERAP was certified by the Coastal Commission in 1982 and last updated in 1995. The ERAP outlines numerous policies pertaining to the preservation and restoration of sensitive coastal habitat, with strong provision for recreation, a primary use in this area zone AE. ERAP policies have influenced the development of the proposed Project, and the Project designs are intended to address recreation in the context of agricultural production and habitat restoration within the Coastal Zone generally, and within the jurisdiction of Humboldt County's ERAP area, particularly.

The ERAP contains the definition of Recreation, to wit: ***"Recreation, Private, and Noncommercial"*** *– clubs or recreation facilities operated by a nonprofit organization and open only to bona fide members of such nonprofit organization and their guests* (ERAP, C6-P6).

Various sections of the ERAP provide guidance to evaluation of the proposed Project and its impacts. These are outlined by Section, below.

> *2.20 COASTAL ACT GOALS AND POLICIES*
>
> *The state legislature, by enacting the Coastal Act of 1976, adopted the following basic goals for the Coastal Zone (a) Protect, maintain and, where feasible, enhance and restore the overall quality of the coastal zone environment and its natural and man-made resources; (b) Assure orderly, balanced utilization and conservation of coastal zone resources, taking into account the social and economic needs of the people of the state. (c) Maximize public*

access to and along the coast and maximize public recreational opportunities in the coastal zone consistent with sound resource conservation principles and constitutionally protected rights of private property owners. (d) Assure priority for coastal-dependent development over other development on the coast. (e) Encourage state and local initiatives and cooperation in preparing procedures to implement coordinated planning and development for mutually beneficial uses, including educational uses, in the coastal zone.

3.25 RECREATIONAL AND VISITOR SERVING USES

30213. (Part) Lower cost visitor and recreation facilities … shall be protected, encouraged, and, where feasible, provided. Developments providing public recreational opportunities are preferred.

30222. The use of private lands suitable for visitor-serving commercial recreational facilities designed to enhance public opportunities for coastal recreation shall have priority over private residential, general industrial, or general commercial development, but not over agriculture or coastal-dependent industry.

30223. Upland areas necessary to support coastal recreational uses shall be reserved for such uses, where feasible.

30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

30252. The location and amount of new development should maintain and enhance public access to the coast by assuring that the recreational needs of new residents will not overload nearby coastal recreation areas by correlating the amount of development with local park acquisition and development plans with the provision of onsite recreational facilities to serve the new development.

B. RECREATIONAL OPPORTUNITIES

1 The County encourages the provision of on-site recreational opportunities in major new development.

Tsunamis–New development below the level of the 100 year tsunami run-up elevation described in Tsunami Predictions for the West Coast of the Continental United States (Technical Report H-78-26 by the Corps of Engineers) shall be limited to public access, boating, and public recreation facilities. (ERAP C3-P16)

1. The zoning of all agricultural lands shall not permit any use that would impair the economic viability of agricultural operations on such lands; and a conditional use permit shall be required of any proposed use not directly a part of agricultural production of food or fiber on the parcel; except that on parcels of 60 acres or larger, a second house for parents or children of the owner-operator shall be considered a direct part of agricultural production. Other uses considered compatible with agricultural operations include:

a. Management for watershed

b Management for fish and wildlife habitat

c. Recreational uses not requiring non-agricultural development under the control of the owner

d. The erection, construction, alteration, or maintenance of gas, electric, water or communications transmission facilities. (Radio or television transmitting antennae shall require a conditional use permit; but such a development shall not in concept be considered incompatible with agricultural use per se.)

e. Farm labor housing and temporary labor camps of less than one year duration shall require a conditional use permit. (ERAP C3 – P25)

FINDINGS FOR PERMITTING OF RECREATIONAL FACILITIES

1. Public or private recreational facilities and visitor-serving facilities shall be permitted only where the following findings are made by the Planning Commission:

a. The proposed development includes adequate on-site services for water, waste disposal, parking and other facilities necessary to serve the proposed use.

b. The proposed development would not create traffic flows detrimental to agricultural or forestry uses in the Planning Area; except that where the proposal includes a showing that such adverse impacts will be mitigated through road improvements or other means within two years of project approval, the development shall be approved.

c. No location within an Urban Limit Area is more feasible.

d. The development does not constitute conversion of agricultural or timber lands inconsistent with the requirements of this chapter.

e. In the case of visitor serving facilities that an established recreational use exists. in the immediate area, or will be provided by the development, for which the visitor-serving facility is appropriate commercial service.

(ERAP C3-P30-31).

3.15.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would be considered to have a significant impact on recreational resources if it would result in any of the following:

- 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; or
- include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The following sections describe the anticipated environmental impacts on recreational resources due to the Project.

3.15.4 Methodology

The impact analysis included in this section is based on usage patterns, traffic records, interviews and other information collected by the County of Humboldt, TWC, the State Coastal Conservancy and its partners.

3.15.5 Impacts and Mitigation Measures

Impact REC-1: 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.

Visitation to surrounding parks and recreational facilities is low. The proposed Project is unlikely to significantly increase or alter that level of visitation. Nearby Centerville Beach County Park might experience a slight increase in visitation correlated to new visitor trips to EREP, but only at an insignificant level. This slight increase in visitation to Centerville Beach County Park is not anticipated to result in a "substantial physical deterioration of the facility." The impact is less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact REC-2: Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The Project includes several recreational features that have the potential to have an adverse physical effect on the environment. These include minor improvements to the main barn parking area, a North Barn interpretive area, a boardwalk and trail through the dunes to the beach, a replacement access road to the North Barn and two kayak put in/take outs.

Improvements to the parking area at the main barn as well as at the North Barn Interpretive area would involve minor grading of the existing parking areas, minor maintenance and structural reinforcements to the North Barn for utilities and public safety. In addition, work at the North Barn area would entail installation of a boardwalk extending from the parking area into the dune system, installation of a vault toilet at the North Barn and South Barn for staff and visitor use and finally installation of interpretive panels, primarily inside the North Barn to provide educational opportunities on the ecological, social and agricultural heritage of the area. Each of these elements is evaluated in this EIR for potential impacts. See Section 3.2 (Agriculture and Forest Resources) for a discussion of potential impacts to agricultural resources; Section 3.3 (Air Quality) for a discussion of potential impacts to air quality; and Section 3.4 (Biological Resources) for a discussion of potential impacts to biological resources.

The proposed Project features are intended to reduce the physical effect on the environment from visitors to the area. This is particularly true for the proposed improvements at the North Barn and South Barn. The existing parking areas at the barns are proposed for minor improvements intended to reduce erosion, provide catchment swales and limit and confine vehicular use within a prescribed area and diminish the amount of driving within the Project footprint. The boardwalk and trail through the dunes is intended to help phase out the existing network of trails through the dunes and limit ingress and egress through the dunes to a single elevated trail that encourages revegetation efforts and dune stability. Similarly, the vault toilets proposed for the North and South Barns are intended to discourage visitors from relieving themselves on the EREP, and to reduce traffic on the EREP for unnecessary bathroom trips back from the North Barn to the entrance.[2] Interpretive panels are proposed to educate visitors about the ecological and agricultural compatibility of the Project, as well as to communicate rules intended to avoid recreational-agricultural conflicts. For all of these reasons, the North Barn, boardwalk and trail and South Barn

[2] Vault toilets also reduce the need for delivery or maintenance trucks necessary for portable toilets presently servicing the EREP.

components of the Project are not expected to have an adverse physical effect on the environment, rather a beneficial effect on the environment.

The Project includes two kayak put in/take out structures, one at the proposed bridge over Centerville Slough, and one to the outboard side of the Cutoff Slough Tidegate. The initial and ongoing purpose of these facilities is to enable the landowner and Project partners to conduct the extensive post-Project biological, hydrological and water quality monitoring that would undoubtedly be required as part of the permit conditions for the Project. Following implementation, visitors would also be able to use the facilities for educational and recreational purposes. These features are proposed for an isolated and low-elevation part of the EREP. Thus, the facilities are likely to remain unnoticeable to surrounding areas, with no adverse aesthetic impacts anticipated.

The key question regarding potential adverse impacts related to the proposed Project is whether the proposed improvements would serve to attract high numbers of visitors not currently visiting the EREP. As discussed above, visitation to parks in Humboldt County is low relative to the remainder of the State. Visitation to areas distant from the Highway 101 corridor tends to be even lower. In light of the fact that a visit to the EREP would require at least a several hour commitment of time by the average tourist, it seems unlikely that visitation would increase measurably as a result of the proposed Project. Nevertheless, if visitation doubled in size, visitation to EREP would still fall well below 1,000 visitors per year, or 7 percent of the visitation to the Loleta Visitors Center of the Humboldt Bay National Wildlife Refuge. Therefore, the proposed Project features would not have a significant adverse impact on the environment.

Furthermore, all state laws addressed above provide clear and consistent policy direction to provide, increase or enhance recreational and open space opportunities. The Project is consistent with the Williamson Act, particularly since no cancellation of contracted parcels is envisioned as part of the Project. The Project is consonant with the Coastal Act as expressed in its state and Local Coastal Program form. A consolidated Coastal Development Permit would be sought from the Coastal Commission as part of the Project.

The Humboldt County 1983 General Plan, 2008 Draft General Plan land use designation of the Project area, and the Eel River Area Plan LCP land use designation of the Project area (Agricultural Exclusive), preserves the land for agricultural purposes, but allows recreation as a primary use. Therefore, the Project is compatible with land use designations. However, new facilities do require a finding by the Planning Commission, as described, above. That finding would be sought as part of the Conditional Use Permit for the habitat restoration component of the Project, which is a conditional use for the Project area. The Project's recreational components would not have an adverse physical effect on the environment; therefore, the impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.15.6 Cumulative Impacts

Impact REC-C-1: Cumulative Impacts to Recreational Resources.

There are no recreational resources that would be impacted by the Project. Other plans or projects underway in the area include ongoing planning efforts by CDFW and others to develop a project and new public access program at the Ocean Ranch Unit of the ERWA. A feasibility study was recently completed, and final plans will not be completed for at least two years. Closer to the

Project area, a delayed Public Access Plan due October 2015 for the Salt River Ecosystem Restoration Project will define access plans for both the CDFW-Salt River Unit of the ERWA and the Port Kenyon property owned by the Salt River Watershed Council. Nevertheless, no information would suggest substantial cumulative impacts of recreational demands resulting from the Project or related projects nearby. These measures are consistent with Humboldt County General Plan Policies. Therefore, the Project's incremental effect to recreational resources is not cumulatively considerable and would not contribute to any significant impacts to recreational resources that may be caused by other cumulative Projects.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.15.7 References

Coastal Conservancy, October 21, 2013, *Eel River Estuary Preserve Public Access Plan* prepared for Coastal Conservancy.

California Coastal Commission, *CDP No. 1-10-032 for the Salt River Ecosystem Restoration Project.*

County of Humboldt Traffic Records, Roadrunner, *Daily Vehicle Volume Report*, 2008, 2010.

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3.16 Transportation

This section evaluates the potential impacts to transportation during construction and operation of the proposed Project. To provide the basis for this evaluation, the Setting section describes the existing conditions related to transportation for the Project area, and the Regulatory Framework section describes the regulatory background that applies to the Project. The evaluation section establishes thresholds of significance, evaluates potential transportation impacts, and identifies the significance of impacts.

3.16.1 Setting

The following information discusses the transportation-related context in which the proposed Project would be constructed and operated, including a description of the roadway network and public transit, pedestrian, and bicycle facilities in the Project area.

Roadways

U.S. Highway 101 and State Route 211 are State highways that provide regional access to the Project area. The 2013 annual average daily traffic[1] reported for these highways in the vicinity of the Project area ranged from 40,200 for U.S. Highway 101, and 12,300 for State Route 211 (Caltrans 2013). According to the *2014 Humboldt County Association of Governments (HCAOG) Regional Transportation Plan*, highways in Humboldt County currently provide adequate facilities and level of service (HCAOG 2014).

Centerville Road and Russ Lane would provide localized access to the Project site. Both are County roadways that provide access to farms, residences, Centerville Beach and other land uses in the Project area. The current intersection of Centerville Road and Russ Lane is an unsignalized intersection with a stop-sign at Russ Lane on to Centerville Road. These roadways have a low volume of use; traffic counts taken along Centerville Road in 2010 reported total traffic volumes ranging from 983 vehicles per day near the Ferndale City limits to 114 vehicles per day near the intersection of Centerville Road and Meridian Road, which is located approximately 1.5 miles to the east of the intersection of Centerville Road and Russ Lane. Traffic counts would be less along Russ Lane, which provides access to the Project site, one residence, and farms.

Pedestrian and Bicycle Facilities

As specified in the *Humboldt County Regional Transportation Plan*, all streets, roadways, and highways in Humboldt County are open to bicycle use (HCAOG 2014). Humboldt County's bikeways are generally classified according to Caltrans' definitions for Class I, II, and III bikeways, as defined below.

Class I "Bike Path": A separated, surfaced right-of-way designated exclusively for non-motorized use (can be solely for bicyclists, or can be shared with pedestrians and/or equestrians). The minimum width for each direction is 8 feet (1.5 meters), with a 5 feet (2.4 meter) minimum width for a bi-directional path.

Class II "Bike Lane": Within the roadway, a lane for preferential bicycle use, at least 4 feet wide or 5 feet when next to a gutter or parking. Established by a white stripe (on roadway) and "Bike Lane" signs. Adjacent vehicle parking and motorist crossflow is allowed. On a two-way road, a bike lane is required on both sides.

[1] The total volume for the year divided by 365 days

Class III "Bike Route": A roadway that does not have a Class I or II bikeway, where bicyclists share a travel lane with motorists. Sometimes created to connect other bikeways. Can be established by a "Bike Route" sign, but not required.

Unclassified bikeway: Streets, roadways, and highways without features to qualify as Class I, II, or III.

No Class I, II, or III bikeways are presently located on or adjacent to the Project site, or along Centerville Road and Russ Lane. Additionally, no pedestrian improvements, including sidewalks, are located at the Project site or along local roadways in the Project area.

Both the *Humboldt County Regional Transportation Plan* and *Regional Bicycle Plan* identify Centerville Road adjacent to the Project area as a future Class III bicycle route in (HCAOG 2012; 2014).

Public Transit

Public transit in Humboldt County is primarily provided by the Humboldt Transit Authority (HTA), a joint powers authority established in 1975 between Humboldt County and the cities of Arcata, Eureka, Fortuna, Rio Dell and Trinidad. HTA operates and maintains the Redwood Transit System, the Willow Creek Transit Service, and the Southern Humboldt Transit Systems. Also, under contract, HTA operates and maintains the Eureka Transit System, and provides paratransit administrative services for the region. Several community and social service organizations throughout Humboldt County also provide transportation services aside from public transit and paratransit.

Public transit service and facilities are not presently provided at or near the Project site, including along Centerville Road or Russ Lane, or within the City of Ferndale to the east of the Project site. Additionally, the *Humboldt County Regional Transportation Plan* does not identify plans for future transit facilities within the Project area.

Airports

Of the nine public use airports in Humboldt County, the nearest to the Project site is Rohnerville Airport, located approximately 10 miles east of the Project site. The Project site is not located within land use compatibility zones around Rohnerville Airport, or in the vicinity of a private airport.

3.16.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project related to transportation.

State

The Caltrans has discretionary authority with respect to highways under its jurisdiction. State highways in Humboldt County are under the jurisdiction of Caltrans District 1. Caltrans issues encroachment permits and permits to operate the movement of oversized or excessive load vehicles on State roadways, such as U.S. Highway 101 and State Route 211. Caltrans also requires a Transportation Management Plan for any traffic restrictions and detours that could affect the highway system, which must be prepared in accordance with the California Manual on Uniform Traffic Control Devices.

Regional and Local

County of Humboldt General Plan Policies

The following goal from the *Humboldt County General Plan* is applicable to the Project with regard to transportation.

4220 Goal: To develop, operate and maintain a well-coordinated, balanced, circulation system that is safe, efficient and provides good access to all cities, communities, neighborhoods, recreational facilities and adjoining regions.

Humboldt County Association of Governments Regional Transportation Plan

The HCAOG is a joint powers authority comprising the County of Humboldt and the seven incorporated cities, each with a seat on the Board of Directors. Under its authority as the Regional Transportation Planning Agency (RTPA) for Humboldt County, HCAOG adopts and submits an updated *Regional Transportation Plan* to the California Transportation Commission and Caltrans every five years. The *Regional Transportation Plan* is a long-range (20-year) transportation planning document for Humboldt County. The most recent five-year update of the RTP was adopted in 2014. The *Regional Transportation Plan* does not currently establish vehicular level of service criteria for County roadways in the Project area. The *Regional Transportation Plan* does indicate plans for a Class III bikeway along Centerville Road extending from the Ferndale city limit to the east of the Project area to Centerville Beach to the west of the Project area (HCAOG 2014).

Humboldt County Regional Bicycle Plan

The *Humboldt Regional Bicycle Plan* is a 20-year planning document that is updated every five years. The primary goal stated in the 2012 Update of the *Regional Bicycle Plan* is to create the safest conditions for bicyclists by providing bikeways and improving roadways to eliminate barriers to bicycle travel (HCAOG 2012). Projects identified as priorities in the current *Regional Bicycle Plan* are anticipated to be implemented over a five-year period. One such project is a proposed Class III bikeway along Centerville Road extending from the Ferndale city limit to the east of the Project area to Centerville Beach to the west of the Project area.

3.16.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to transportation, as defined by the CEQA Guidelines (Appendix G), if it would:

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit;
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- 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;
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- Result in inadequate emergency access; or

- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

Areas of No Project Impact

As explained below, construction and operation of the Project would not result in impacts related to two of the significance criteria identified in Appendix G of the current CEQA Guidelines as mentioned above. The following significance criteria are not discussed further in the impact analysis, for the following reasons:

- **Would the Project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?** Humboldt County is considered rural and does not have a Congestion Management Agency or an adopted Congestion Management Program. Therefore, no conflict with an applicable congestion management program would occur. This significance criterion is not applicable to the proposed Project and is not discussed further.
- **Would the Project 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?** The proposed Project is not located within an airport land use plan or within two miles of a public airport. Project construction and operation would include only ground-based travel. Therefore, this significance criterion is not applicable to the proposed Project and is not discussed further.

3.16.4 Methodology

This impact analysis below evaluates the potential for the Project to conflict with the County's adopted plans and policies related to circulation, including the *General Plan*, *Regional Transportation Plan*, and *Regional Bicycle Plan*. The analysis also evaluates the potential for the Project to have short-term or long-term impacts on roadways, emergency access, or on the safety of vehicular traffic, bicyclists, and pedestrians.

3.16.5 Impacts and Mitigation Measures

Impact TR-1: Conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system.

<u>Construction</u>

Construction traffic for the Project would result in a short-term increase in construction-related vehicle trips on U.S. Highway 101, State Route 211, Centerville Road, and Russ Lane. Construction would result in vehicle trips by construction workers and haul-truck trips for delivery and disposal of construction materials to and from the subject site. The number of construction-related vehicles traveling to and from the site would vary on a daily basis; however, it is not expected that traffic control would be required as a component of this Project as access routes are limited, and sediment re-use would be contained within the Project area so there would be no sediment off-haul.

Because the Project would attempt to balance the cut and fill (approximately 325,000 cubic yards) on-site through various beneficial reuses, as described in Section 2.4.7 (Beneficial Reuse of Excavated Sediment) the number of haul truck trips over the course of construction would be low.

Construction vehicles and workers would utilize County highways and roadways to travel to the site. Construction activity would not, however, require any excavation or other work within a Caltrans or County right-of-way of local highways and roadways, and would not require the closure or restriction of a highway or roadway during construction.

As required by the Caltrans, Project work that requires the movement of oversized or excessive load vehicles on State roadways, such as U.S. Highway 101 and State Route 211, would require a transportation permit issued by Caltrans. Additionally, a Transportation Management Plan would be required for any traffic restrictions and detours that could affect the highway system, which would be prepared in accordance with the California Manual on Uniform Traffic Control Devices. Because the Project would not require encroachment onto a Caltrans or County right-of-way, and with required compliance with the Caltrans permit for movement of any oversized or excessive load vehicles, the temporary impact of haul-trucks on the circulation system would be less than significant.

Please refer to Impact TR-4 below for additional evaluation of potential impacts to pedestrian and bicycle facilities and mass transit.

Operation

Section 4220 of the Humboldt County General Plan seeks to develop, operate and maintain a well-coordinated, balanced, circulation system that is safe, efficient and provides good access to all cities, communities, neighborhoods, recreational facilities and adjoining regions. The *Humboldt County General Plan* and *Regional Transportation Plan* do not currently establish level of service criteria for County roadways in the Project area.

The Project would result in approximately three to six additional vehicles visiting the site per week compared to existing conditions. This increase in Project trips equates to less than one additional vehicle per day. Additionally, the Project would not result in changes to the existing roadway network. Access to the Project site would remain from Russ Lane via Centerville Road. The Project would not change the configuration or capacity of any roadways or intersections, and would not affect existing speed limits. The Project would not conflict with the goals outlined in Section 4220 of the *Humboldt County General Plan*.

The *Humboldt County Regional Bicycle Plan* (HCAOG 2012) and *Regional Transportation Plan* (HCAOG 2014) include plans for a Class III bikeway along Centerville Road extending from the Ferndale city limit to Centerville Beach to the west. The Project would not preclude the use of Centerville Road as a future Class III bicycle lane as envisioned in the HCAOG *Regional Transportation Plan* and *Regional Bicycle Plan*, because it would not change the configuration of the roadway or its roadway capacity for automobiles, would not change existing speed limits, and would not result in a substantial increase in automobile travel comparative to existing conditions. Therefore, the Project would not conflict with the HCAOG *Regional Transportation Plan* and *Regional Bicycle Plan*.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-2: Substantially increase hazards due to design feature or incompatible use.

The Project would generate a temporary increase in traffic on local roadways related to the transport of materials to and from the site. The Project would not require the temporary closure or alteration of a roadway, or construction work within the right-of-way of roadways. Vehicles would

access the Project site from Russ Lane via Centerville Road. The intersection of these roadways would not be altered from existing conditions, and speed limits along the roadways would not be changed. Following construction, the approximately three to six additional vehicles that would visit the site per week compared to existing conditions would not result in queuing of traffic onto Russ Lane, Centerville Road or other roadways. Therefore, the potential for Project construction or operational activities to increase hazards due to a design feature or incompatible use is considered less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-3: Result in inadequate emergency access.

Construction and operation of the Project would not require roadway closures or construction activities within the right-of-way of local roadways, including Centerville Road or Russ Lane. Implementation of the Project would not prevent emergency access to the Project site or to adjacent land uses along Centerville Road or Russ Lane.

As described above, operation and maintenance of the Project would result in approximately three to six additional vehicles that would visit the site per week compared to existing conditions. This increase in Project trips equates to less than one additional vehicle per day. Such a minimal increase in traffic along roadways would not affect fire protection services or emergency response times to the Project site or surrounding residences in the Project area. The impact on emergency access would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-4: Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or decrease the performance or safety of such facilities.

There are no existing public transit routes, bicycle routes or pedestrian facilities located along the access routes to the Project site, including Russ Lane and Centerville Road. Project construction activities would, therefore, not impact the performance or safety of such routes or facilities.

Both the *Humboldt County Regional Transportation Plan* (HCAOG 2014) and the *Humboldt Regional Bicycle Plan* (HCAOG 2012) envision the future establishment of a Class III bicycle route along Centerville Road in the general Project area. Because the Project would not alter the configuration of Centerville Road or its intersection with Russ Lane, it would not preclude the future establishment of a Class III bicycle route in the area. Because only three to six additional vehicles would be expected to visit the site per week compared to existing conditions, and because the Project would not result in increases to motor vehicle speeds or queuing of traffic onto Centerville Road, it would not substantially increase exposure of bicyclists and pedestrians to vehicle conflict areas.

The *Humboldt County Regional Transportation Plan* does not identify proposed public transit routes in the Project area, and because only three to six additional vehicles would be expected to visit the site per week compared to existing conditions, the Project would not create a demand for public transit service.

The potential conflict of the Project with adopted plans regarding public transit, bicycle, and pedestrian facilities would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.16.6 Cumulative Impacts

Impact TR-C-1: Cumulatively considerable contribution to cumulative impacts related to transportation.

The geographic scope for the analysis of cumulative impacts on transportation and circulation consists of the areas that use the same roadways as the Project.

Construction of the Project may overlap with cumulative projects that would be under construction or would be reasonably foreseeable in the Project area. However, no past, present, or reasonably foreseeable projects have been identified that would result in substantial changes in construction traffic, operational traffic, or changes to the circulation system in the Project area.

As summarized in Impacts TR-1 through TR-4, Project construction and operational activities would not conflict with applicable plans, ordinances and polices related to circulation in Humboldt County, would not increase hazards due to a design feature or incompatible use, would not affect fire protection services or emergency response times to the Project site or surrounding area, and would not decrease the performance or safety of public transit, bicycle, and pedestrian facilities.

Therefore, the potential for cumulative impacts to occur related to transportation during construction and operation of the proposed Project activities would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.16.7 References

California Department of Transportation (Caltrans), 2013, *2013 All Traffic Volumes on CSHS*.

Humboldt County Association of Governments (HCAOG), 2012, *Humboldt Regional Bicycle Plan, Update 2012*.

HCAOG, 2014, *20-Year Regional Transportation Plan, 2014 Update*, August.

Humboldt County, 1998, *Humboldt County General Plan, Volume I, Framework Plan*.

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4. Alternatives Description and Analysis

4.1 Introduction

This chapter presents the alternatives analysis for the Project. Section 15126.6(a) of the CEQA Guidelines requires EIRs to "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project. Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation. An EIR is not required to consider alternatives which are infeasible. The lead agency is responsible for selecting a range of project alternatives for examination and must publicly disclose its reasoning for selecting those alternatives. There is no ironclad rule governing the nature or scope of the alternatives to be discussed other than the rule of reason." This section of the CEQA Guidelines also identifies the purpose (15126.6[b]) which is for the EIR to identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1). The discussion of alternatives shall focus on alternatives to the project or its location, which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.

The CEQA Guidelines further require that the alternatives be compared to the proposed project's environmental impacts and that the "no project" alternative be considered (Section 15126.6[d] and [e]). CEQA Guidelines Section 15126.6(e)(1) states that the purpose of describing and analyzing the no project alternative is "to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project." The no project analysis is required to "discuss the existing conditions at the time the notice of preparation is published…as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Section 15126.6[e][2]). If the project is a "development project on identifiable property", the "no project" alternative is the circumstance under which the project does not proceed. Here the discussion would compare the environmental effects of the property remaining in its existing state against environmental effects which would occur if the Project is approved. In certain instances, the no project alternative means "no build" wherein the existing environmental setting is maintained. This would be the case for the proposed Project.

4.1.1 Identifying Project Alternatives

Meetings amongst property owners within and adjacent to the Project area to discuss land management and Project alternative options for the proposed Project began in 2009-2011. Numerous Project alternatives have been explored in the context of these discussions and in the development of a proposed Project. Ultimately, a proposed Project limited to TWC property was developed and a Notice of Preparation was circulated in December 2014. Subsequently, and in order to extend drainage and sea level rise adaptation benefits to surrounding properties, adjacent landowners requested participation in a broader project. The proposed Project was revised and re-scoped in 2015.

The alternatives analyzed in this chapter in addition to the proposed Project include the No Project Alternative, the 2014 (original) NOP Alternative and the Full Tidal Exchange Alternative. The environmentally superior alternative is described in Section 4.3, and alternatives which were considered but are not being carried further in this Draft EIR are described in Section 4.4 below. Resource categories identified as having no impacts are not discussed below.

4.2 Description of Alternatives

4.2.1 Alternative 1: No Project Alternative

Under the No Project Alternative no modifications to the Project area are proposed. The alternative maintains the existing levee and tidegate conditions and continues to preclude tidal exchange within the Project area with no provisions for sea level rise adaptation, sediment management, drainage improvement or ecosystem restoration. The Project site would continue to be managed to maximize agricultural potential and flood control. There are no internal channel, culvert, tidegate, dune or levee improvements proposed under the No Action Alternative. Discussion of this alternative deliberately though incorrectly assumes that the existing channel geometry of Western Drainage Ditch and Russ Creek is static, and not subject to aggradation and infilling.

The No Project Alternative would have similar impacts to the proposed Project for Public Services, Recreation, and Transportation resource categories; and lesser impacts than the proposed Project for all other resource categories with the exception of agricultural, biological and hydrology as overtime these resources would continue to degrade.

4.2.2 Alternative 2: 2014 NOP

The 2014 Original NOP provides a detailed description of the proposed Project elements for this alternative. Figure 4-1 summarizes the enhancement features associated with the 2014 NOP alternative, which is restricted to the EREP, or TWC property. Specific alternative hydraulic design details include the following.

1. Install new culverts between the Inner Marsh and existing outer Cut-Off Slough channel as described in the proposed Project. Seasonal control of maximum muted tide levels would be the same as described for the proposed Project.
2. Replace one existing flap gate in the existing Cut-Off Slough tide structure with a new side-hinge tidegate equipped with a 1-meter square auxiliary fish passage door. Retrofitted structure is intended to maintain the current water levels within inner Cut-Off Slough.
3. Improve existing internal berm around north, east and south sides of Inner Marsh to uniform minimum elevation of 5-feet. Remove two northern-most existing culverts through inner berm and fill and reconstruct berm.
4. Remove existing culverts at south end of Inner Marsh berm and replace with three new 5-foot diameter gated culverts to allow positive flow only between Centerville Slough and the Inner Marsh.
5. Excavate new 140- to 120-foot wide Centerville Slough along alignment indicated in Figure 4-1, upstream of the existing TWC Bridge. Connect the north end of new channel with existing Cut-Off Slough. Bottom of channel constructed to elevations ranging from 2-feet at south end to 0-feet NAVD88 at the tie-in to Cut-Off Slough.

6. Construct new 60-foot to 50-foot wide Russ Creek channel north of the RR&T-TWC property boundary along alignment indicated on Figure 4-1. This channel merges with new Centerville Slough approximately 650-feet upstream (south) of the existing TWC Bridge. Bottom elevation of 2.0-feet NAVD at confluence with Centerville Slough grades up to existing 8.0-feet NAVD88 channel bed elevations at the RR&T-TWC property boundary.
7. Raise the elevation of the access road bordering the TWC-ORF properties to a uniform elevation of 8-feet.
8. Construct a short boardwalk and trail with an overlook which would take visitors along an existing trail, near the North Barn, into an intact dunefield for birding and natural observation.
9. Reestablish the dune configuration at the northern and central sites.

Aesthetics

Impacts associated with the 2014 NOP Alternative would be similar to the proposed Project (less than significant) for the EREP portion of the Project; however, for the overall Project, impacts would be greater for the proposed Project because the proposed Project includes the RR&T property south of the EREP. Thereby increasing Project activities (i.e., new gated culvert, improve and extend existing berm, re-establish dune configuration, realign Shaw Creek and re-establish connectivity to Centerville Slough, establish sediment management area, etc.) in size, and proximity to Centerville Road. Therefore, the 2014 NOP Alternative would have lesser aesthetic impacts than the proposed Project.

Agricultural Resources

As with the proposed Project, the 2014 NOP Alternative would also have very similar agricultural resources impacts with respect to conversions of agricultural land. Similarly, the 2014 NOP Alternative would have less than significant impacts to agricultural resources, due primarily to the same proposed improvements in drainage and sediment management that increase overall agricultural productivity within the EREP. Therefore, the 2014 NOP Alternative is found to be commensurate in impact and benefit with the proposed Project. However, this alternative provides a far lower level of long-term protection and resiliency to the overall Project area. In particular, this alternative excludes activities south of the EREP such as dune enhancements, berm and new Centerville Slough on the RR&T property intended to protect the agricultural land from future wave over wash. Therefore, the 2014 NOP Alternative would have equal agricultural resources impacts compared to the proposed Project, but still less than significant impacts. Neither the proposed Project nor this alternative would have any impacts to forest resources as there are no forest resources on the Project site.

Air Quality

The air quality impacts associated with the proposed Project were determined to be less than significant, particularly with implementation of Mitigation Measure AQ-1 (Dust Control Measures during Construction) which complies with the best management practices recommended by air districts to reduce construction-related dust. As with the proposed Project, the 2014 NOP Alternative would have less than significant impacts to air quality. Air quality impacts (i.e., emissions) associated with the 2014 NOP Alternative would be less than the proposed Project because there would be no construction activities (therefore less emissions) south of the EREP; therefore, this alternative would have lesser air quality impacts than the proposed Project.

Biological Resources

Biological resources impacts associated with the proposed Project were determined to be less than significant, particularly with implementation of mitigation measures (reference Section 3.4.5). Biological resources impacts associated with the 2014 NOP Alternative would also be less than significant with implementation of mitigation measures. Biological resources impacts associated with this alternative would be similar to the proposed Project for the EREP portion of the Project; however, with the removal of the RR&T property, and the construction-related activities in that area, there would be no construction-related biological resources impacts and no wetlands fill south of the EREP with this alternative. Therefore, this alternative would have lesser initial biological resources impacts than the proposed Project. In the long-run, it is plausible that this alternative would present slightly greater impacts to biological resources in the absence of habitat improvements to Russ Creek south of the EREP, and resulting improvement of biological connectivity between the estuary and the Wildcat Hills via Russ Creek. However, it is probable that these improvements could be compensated for through increased quality of habitat on Russ Creek on the EREP.

As with the proposed Project, minus the RR&T land south of the EREP, this alternative would also provide a net benefit to terrestrial, avian and aquatic species by the introduction of a muted tidal exchange into the EREP and recreates historic on- and off-channel ponds and the associated wetland habitats within the historic back-dune Centerville Slough channel system.

Cultural Resources

The potential impacts on cultural resources anticipated with this alternative are expected to be less than with the proposed Project because less land would be subject to construction-related activities with this alternative. However, as with the proposed Project, construction of the Project under this alternative could unearth unknown cultural resources which would be a significant impact. The same mitigation measures for the proposed Project (Mitigation Measures CR-1, CR-2, and CR-3) would also be applicable to this alternative (reference Section 3.5.5).

Geology and Soils

As with the proposed Project, the 2014 NOP Alternative would have less than significant impacts to geology and soils. The 2014 NOP Alternative would have fewer impacts than the proposed Project because less land would subject to construction-related activities with this alternative. The recommendations in the Geotechnical Study, as with the proposed Project, would still be applicable to this alternative.

Greenhouse Gas Emissions

As with the proposed Project, this alternative would result in a temporary increase in GHG emissions, including exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy-duty equipment. However, the 2014 NOP Alternative would have fewer impacts than the proposed Project because less land would subject to construction-related activities; therefore, less GHG emissions, with this alternative. As with the proposed Project, this alternative would also result in a less than significant impact for construction and operational activities.

Hazards and Hazardous Materials

The 2014 NOP Alternative would have fewer hazards and hazardous materials impacts than the proposed Project because less land would subject to construction-related activities with this alternative. As with the proposed Project, construction and operation of the proposed Project would not create a significant hazard to the environment or general public involving the release of hazardous materials into the environment.

Hydrology and Water Quality

As with the proposed Project, this alternative would also be subject to the same permits (reference Section 2.6) and have to comply with the same Humboldt County and NCRWQCB requirements with regard to water quality standards or waste discharge requirements as the proposed Project. The recommendations in the Geotechnical Study would also apply to this alternative. Hydrology and water quality impacts were determined to be less than significant with implementation of mitigation measures for the proposed Project (reference Section 3.9.5), and are anticipated to be less than significant for this alternative. However, the improvements to Centerville Slough and Russ Creek would be limited to EREP property only; thus, poor drainage and unchecked wave over wash would still occur on RR&T property. Therefore, although the hydrology and water quality impacts are anticipated to be similar, the resulting hydrologic deterioration of agricultural pastures on RR&T property under this scenario is expected to be more severe. The hydrology and water quality impacts associated with this alternative are anticipated to be greater than with the proposed Project.

Mineral and Energy Resources

As with the proposed Project, there would be less than significant impacts to mineral and energy resources associated with the 2014 NOP Alternative. The 2014 NOP Alternative would use even fewer materials (i.e, aggregate) derived from mineral resources and less energy than the proposed Project, as the construction footprint would be smaller than the proposed Project.

Noise

Similar to the proposed Project, implementation of this alternative would generate construction-related and maintenance noise associated with the use of heavy equipment within the EREP. However, there would be no construction-related or maintenance activities south of the EREP with this alternative. Therefore, noise impacts would be lesser overall than the proposed Project.

Public Services and Utilities

None of the alternatives would have a substantial adverse impact to public services or utilities as none are proposed. The 2014 NOP Alternative would have nominal impacts to public services and utilities similar to the proposed Project.

Recreation

As with the proposed Project, no recreational facilities are proposed for RR&T, and the 2014 NOP alternative differs little from the Project. Therefore, the 2014 NOP Alternative would have less than significant impacts to recreational resources. The 2014 NOP Alternative would not have a substantial adverse impact on existing or future recreational resources. As with the proposed Project, this alternative would have a beneficial impact on recreational resources by increasing visitor amenities such as: improved parking, signage, vault toilet, boardwalk for birding and observation, and two kayak put in and take outs.

Transportation

As with the proposed Project, the 2014 NOP Alternative would have less than significant impacts to transportation and circulation. Transportation impacts associated with this alternative would be lesser than with the proposed Project because there would be less construction-related and maintenance equipment and vehicles traveling to and from the Project site with the elimination of approximately 753 acres south of the EREP.

4.2.3 Alternative 3: Full Tidal Exchange

The Full Tidal Exchange Alternative assumes removing the existing Cut-Off Slough tidegates along with the existing levee bordering the north end of the Inner Marsh. This alternative allows for full and unrestricted tidal exchange back into the former wetlands/tidelands. No other improvements or infrastructure protections are included in this alternative.

Aesthetics

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to aesthetic resources. Impacts associated with the Full Tidal Exchange Alternative would be less than the proposed Project because the only construction-related work would be the removal of the existing Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh. None of the other proposed Project activities would be carried out; therefore, this alternative would have lesser aesthetic impacts than the proposed Project.

Agricultural Resources

The Full Tidal Exchange Alternative would have greater agricultural resources impacts than the proposed Project because this alternative would cause the greatest area of maximum inundation compared to the proposed Project and other alternatives by flooding (saltwater) existing agricultural lands in the Project area. According to the *Hydraulic Design and Feasiblity Assessment Report* prepared for the Project (Kamman Hydrology & Engineering 2016), this alternative would result in un-muted tidal exchange and higher water levels relative to the other alternatives. Therefore, this Alternative would have greater agricultural resources impacts than the proposed Project. Neither the proposed Project nor this alternative would have any impacts to forest resources as there are no forest resources on the Project site.

Air Quality

The air quality impacts associated with the proposed Project were determined to be less than significant, particularly with implementation of Mitigation Measure AQ-1 (Dust Control Measures during Construction) which complies with the best management practices recommended by air districts to reduce construction-related dust. The Full Tidal Exchange Alternative would also be less than significant. Air quality impacts (i.e., emissions) associated with the Full Tidal Exchange Alternative would be substantially less than the proposed Project because there would only be emissions associated with the removal of the Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh; therefore, this alternative would have lesser air quality impacts than the proposed Project.

Biological Resources

Biological resources impacts associated with the proposed Project were determined to be less than significant, particularly with implementation of mitigation measures (reference Section 3.4.5). Impacts associated with this alternative would also be less than significant with implementation of appropriate mitigation measures. Biological resources impacts associated with this alternative would be less than the proposed Project because Project area conditions would be returned to natural historic conditions, and less wetlands would be filled, thereby improving habitat for aquatic species. Impacts to terrestrial species would be more significant under the Full Tidal Exchange Alternative due to extensive inundation of terrestrial habitat. Nonetheless, this alternative would have beneficial biological resources impacts overall.

Cultural Resources

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts to cultural resources. The potential impacts on cultural resources anticipated with this alternative would be less than with the proposed Project because less land would subject to construction-related activities with this alternative. Only the removal of the Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh would have the potential of uncovering unknown cultural resources. However, as with the proposed Project, construction of the Project under this alternative could unearth unknown cultural resources which would be a significant impact. The same mitigation measures for the proposed Project (Mitigation Measures CR-1, CR-2, and CR-3) would also be applicable to this alternative (reference Section 3.5.5).

Geology and Soils

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to geology and soils. The Full Tidal Exchange Alternative would have fewer impacts than the proposed Project because less land would subject to construction-related activities with this alternative. The recommendations in the Geotechnical Study, as with the proposed Project, would still be applicable to this alternative.

Greenhouse Gas Emissions

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to GHG emissions. As with the proposed Project, this alternative would result in a temporary increase in GHG emissions associated with the removal of the Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh, including exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy duty equipment. However, the Full Tidal Exchange Alternative would have fewer impacts than the proposed Project overall because substantially less land would subject to construction-related activities. Furthermore, carbon sequestration rates would increase exponentially due to substantial conversion of agricultural pastures to salt marsh, and methane and CO_2 rates would decrease exponentially due to the reduction in utility of the area for livestock grazing; therefore, there would be fewer GHG emissions, with this alternative. Additionally, there would be no operational activities associated with this alternative; therefore, no operational emissions.

Hazards and Hazardous Materials

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to hazards and hazardous materials. The Full Tidal Exchange Alternative would have fewer hazards and hazardous materials impacts than the proposed Project because less land would subject to construction-related activities with this alternative. As with the proposed Project, construction and operation of the proposed Project would not create a significant hazard to the environment or general public involving the release of hazardous materials into the environment.

Hydrology and Water Quality

The Full Tidal Exchange Alternative would include the removal of the Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh, resulting in the greatest area of maximum inundation within the Project area compared to the proposed Project and other alternatives. Downstream tidal exchange would not be restricted and the Project area would become more characteristic of historic conditions. This alternative could result in an inundated area of approximately 1,951 acres, which would inundate existing farmlands and a few onsite structures; however, there are no homes or people living on the Project site that would be impacted.

Hydrology and water quality impacts were determined to be less than significant with implementation of mitigation measures for the proposed Project (reference Section 3.9.5), however, they are anticipated to be significant for this alternative. This alternative would have both positive biological (inundation more characteristic of historic conditions) and negative agricultural (substantially altering the existing drainage) impacts; therefore, overall impacts are considered neutral to greater than the proposed Project.

Mineral and Energy Resources

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts to mineral and energy resources. As with the proposed Project, there would be less than significant impacts to mineral and energy resources associated with the Full Tidal Exchange Alternative. The Full Tidal Exchange Alternative would not use any materials (i.e, aggregate) derived from mineral resources and less energy than the proposed Project, as there would be no construction activities associated with this alternative.

Noise

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to noise. Similar to the proposed Project, implementation of this alternative would generate noise associated with the removal of the Cut-Off Slough tidegates and removal of the levee bordering the north end of the Inner Marsh. However, there would be no additional construction-related or maintenance activities with this alternative, and construction-related activities would be limited to a much smaller area. Therefore, noise impacts would be lesser overall than the proposed Project.

Public Services and Utilities

As with the proposed Project, the Full Tidal Exchange Alternative would either have no impacts or less than significant impacts to public services, and utilities and service systems. None of the alternatives would have a substantial adverse impact to public services or utilities. The Full Tidal Exchange Alternative would not require any public services or utilities; therefore, this alternative would have fewer impacts overall than the proposed Project.

Recreation

The Full Tidal Exchange Alternative would substantially alter existing and future recreational resources because the Project area would be inundated more frequently because of tidal influences. This change would alter existing recreational uses, but while hiking and equestrian use may decline, duck hunting, fishing and kayaking recreational opportunities would increase. Overall, this alternative would result in use shifts, but would have similar impacts to recreational resources than the proposed Project.

Transportation

As with the proposed Project, the Full Tidal Exchange Alternative would have less than significant impacts with regard to transportation and circulation. Transportation impacts associated with this alternative would be less than with the proposed Project because there would be less construction-related equipment and vehicles traveling to and from the Project site with the removal of the Cut-Off Slough tidegates and levee bordering the north end of the Inner Marsh. There would be no ongoing maintenance vehicle trips associated with this alternative. Therefore, this alternative would be less impactful overall than the proposed Project.

4.3 Environmentally Superior Alternative

Table 4-1 (Comparison of Alternatives to the Proposed Project) compares the significance of the potential impacts for the proposed Project with the alternatives considered in the preceding sections. State CEQA Guidelines Section 15126.6(e)(2) requires that if the No Project Alternative is the environmentally superior alternative, then the EIR must also identify which of the other alternatives is environmentally superior.

As described above, the proposed Project is an environmental restoration and drainage improvement project, and its primary adverse impacts (although still less than significant or less than significant with mitigation) are related to agricultural resources, hydrology, water quality, noise, and biological resources. A number of these impacts are short-term conditions that would result from construction-related activities. The No Project Alternative would eliminate these potential short-term construction-related impacts, and, because it would have the fewest impacts overall, would nominally be the Environmentally Superior Alternative. However, this alternative would forego the near and longer-term environmental benefits of the Project on fisheries, marsh, special-status wetland species habitat and agricultural land resiliency to sea level rise. While the Full Tidal Exchange Alternative would have fewer overall impacts compared to all other alternatives and the proposed Project, the impacts to agricultural resources would be significant and extremely difficult to mitigate; therefore, this alternative is judged to be environmentally inferior. The proposed Project is not the Environmentally Superior Alternative because the other alternatives would have fewer impacts overall during construction and operation. Therefore, this EIR considers the Environmentally Superior Alternative to be the 2014 NOP Alternative.

Table 4-1 Comparison of Alternatives to the Proposed Project

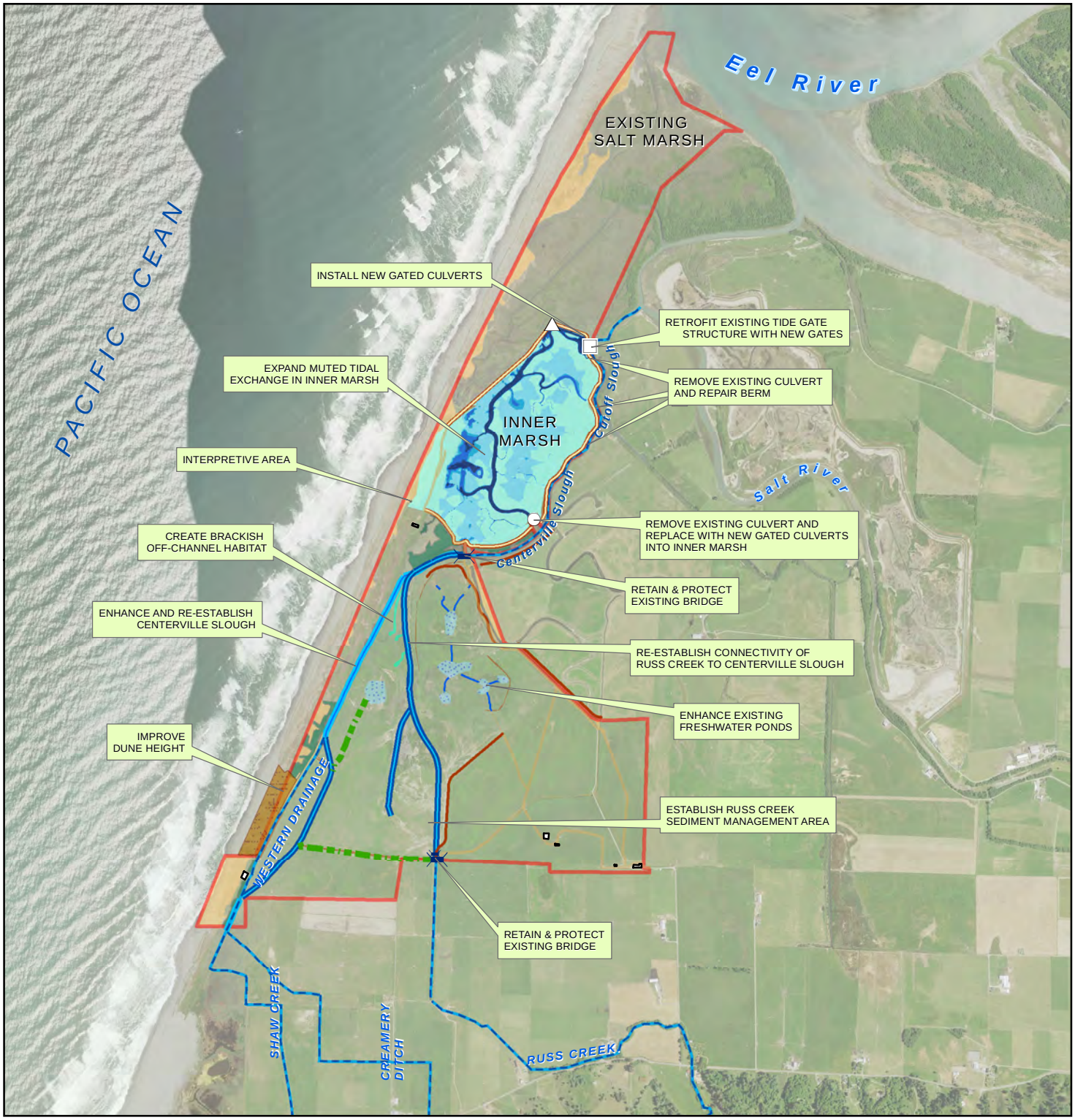
Resource Category	No Project	2014 NOP	Full Tidal Exchange
Aesthetics	-	-	-
Agricultural Resources	+	=	+
Air Quality	-	-	-
Biological Resources	+	-	-
Cultural Resources	-	-	-
Geology and Soils	-	-	-
Greenhouse Gas Emissions	-	-	-
Hazards and Hazardous Materials	-	-	-
Hydrology and Water Quality	+	+	+
Mineral and Energy Resources	-	-	-
Noise	-	-	-
Public Services and Utilities	=	=	=
Recreation	=	=	+
Transportation	=	-	-

Notes: "-" indicates an impact that is less than the proposed Project (environmentally superior)
"+" indicates an impact that is greater than the proposed Project (environmentally inferior)
"=" indicates an impact that is equal to the proposed Project (neither environmentally superior or inferior)

4.4 Alternatives Considered but not Carried Forward in this EIR

During the preliminary modelling and feasibility assessment phase of the Project, various configurations of alternative components were conceptually assessed by Kamman Hydrology & Engineering. Some of these conceptual components were assessed on adjoining lands including

the O'Rourke Foundation (ORF). Expanding the Project components onto the ORF was rejected at the time of scoping by the ORF and therefore alternatives that included components on the ORF were neither fully developed nor fully analysed in this EIR, except insofar as alternatives were analysed to ensure the avoidance of impacts to adjacent properties.



Replace Existing Culverts
New Culvert / Tidegate
Retrofit Existing Tidegate
Bridge

EREP Property Boundary (Reference: Humboldt County Parcel Data)
Buildings

Access Roads
Existing
Proposed
Dike with Improved Access Road
Existing Dike

Proposed Project Components
Existing Drainage
Channel Reestablsh
Channel Enhancement
Historic Drainage to be Abandoned
Freshwater Pond Conveyance

Proposed Project Components
Enhanced Freshwater Complex
Brackish Off-Channel Habitat
Sediment Management Area
Dune Restoration Area

Inner Marsh Muted Tide Levels
< 2.5'
< 3.0'
< 3.5'
< 4.0'
< 5.0'

Paper Size ANSI A

0 500 1,000 2,000 3,000 4,000 Feet

Map Projection: Lambert Conformal Conic
Horizontal Datum: NAD 1983 2011
Grid: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US

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Eel River Estuary and Centerville Slough Enhancement Project

Job Number 8410882
Revision A
Date 21 Jun 2016

2014 NOP Alternative

Figure 4-1

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5. Other CEQA Required Sections

5.1 Growth Inducement

The CEQA requires that an EIR evaluate the growth inducing impacts of a proposed project. A growth-inducing impact is defined as follows:

"[T]he ways in which the proposed project could foster economic or population growth, or the construction of additional housing either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth" (CEQA Guidelines Section 15126.2[d]).

The Project is designed to improve geomorphic and ecosystem functions that would enhance habitat for native fisheries and aquatic species, support waterfowl and wildlife species, and benefit agricultural land management by more effectively managing onsite flooding and sedimentation. The Project does not involve construction of new housing that would result in direct growth inducement.

Construction of the Project is expected to occur over three seasons, approximately 120 days each between May and October for the years 2018 through 2020. Given the relatively moderate construction period spread out over three seasons, and workforce needs (approximately 15 construction personnel per day), no new housing or services would be needed to support the temporary employment demand. Project operation would not result in new permanent employee opportunities because the Project would not include any components that would require additional employment. The Project would not remove an obstacle to additional growth and development in the area, such as removing a constraint on a required public utility or increasing capacity in the Project area. For these reasons, the proposed Project would not be a contributing factor to growth and the associated indirect effects of growth.

5.2 Significant and Unavoidable Impacts of the Proposed Project

In accordance with Section 21100(b)(2)(A) of CEQA and with Sections 15126(b) and 15126.2(b) of the CEQA Guidelines, the purpose of this section is to identify Project-related environmental impacts that could not be eliminated or reduced to a less-than-significant level with implementation of mitigation measures. The findings in this chapter are subject to final determination by the California State Coastal Conservancy as part of its certification of the EIR.

The analysis presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, concludes that implementation of the proposed Project would not result in any significant and unavoidable impacts.

5.3 Significant Irreversible Environmental Changes

In accordance with CEQA Section 21100(b)(2)(B) and CEQA Guidelines Sections 15126(c) and 15126.2(c), the purpose of this section is to identify significant irreversible environmental changes that would be caused by the proposed Project.

Construction activities associated with the Project would result in an irretrievable and irreversible commitment of natural resources through the use of construction materials. The Project would require the commitment of energy resources to fuel and maintain construction equipment (such as gasoline, diesel and oil) during the construction period, as well as resources, such as concrete, steel, and other building materials to be used for the proposed improvements.

Following construction, daily activities would see a minor increase in energy consumption when interpretive activities become part of the EREP's operations. A ranger vehicle patrols the EREP portion of the Project once a day currently and this would continue into the foreseeable future. Guided site visits would likely bring three to six additional vehicles on site per week, and battery-operated pressure transducers are in operation adjacent to tidegates. Therefore, operation of the Project would not result in a significant increase in dependence on non-renewable energy resources or in substantial increases in peak or base-period energy use.

5.4 Energy Resources

To guarantee that energy implications are considered in Project decisions, Appendix F, Energy Conservation, in the CEQA Guidelines requires that EIRs "include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy."

This analysis evaluates the use of energy resources (e.g., fuel and electricity) associated with the construction and operation of the Project. For construction, the analysis considers whether construction activities would use large amounts of fuels or energy, and whether they would be used in a wasteful manner. For energy used during operation and maintenance, the analysis evaluates the potential increase in energy use that would occur with implementation of the Project to determine whether large amounts would be used and whether they would be used in a wasteful manner.

Construction of the Project would require the use of fossil fuels (primarily gas, diesel, and motor oil) for a variety of activities, excavation, grading, demolition, and vehicle travel. The precise amount of construction-related energy consumption is uncertain. However, construction would not require a large amount of fuel or energy usage because of the moderate number of construction vehicles and equipment, worker trips, and truck trips that would be required for a Project of this scale (see Chapter 2, Project Description). In addition, equipment idling times would be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes or less (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Therefore, Project construction would not encourage activities that would result in the use of large amounts of fuel and energy in a wasteful manner.

Following construction, as noted above in Section 5.3, daily activities would see only a minor increase in energy consumption. Therefore, operation of the Project would not use large amounts of additional energy compared to baseline conditions and would not use it in a wasteful manner.

6 List of Preparers

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