



California Department of Fish and Wildlife—Lead Agency



Ocean Ranch Restoration Project Draft Environmental Impact Report

SCH # 2018062020

September 2020

**Draft Environmental Impact Report for the
Ocean Ranch Restoration Project**

SCH # 2018062020

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Acronyms and Abbreviations

AB	Assembly Bill
AE	Agriculture Exclusive
AG	Agriculture Grazing
AMP	Adaptive Management Program
APN	Assessor Parcel Number
ASTM	American Society for Testing and Materials
AST	aboveground storage tanks
AUM	Animal Unit Months
BAAQMD	Bay Area Air Quality Management District
bgs	below ground surface
BMP	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
CCC	California Coastal Commission
CCR	California Code of Regulations
CDC	U.S. Center for Disease Control
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDP	Coastal Development Permit
CE	Common Era
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERES	California Environmental Resources Evaluation System
CESA	California Endangered Species Act
CFCPA	California Farmland Conservancy Program Act
CFGC	California Fish and Game Commission
CFR	Code of Federal Regulations
CGS	California Geological Survey
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
CO _{2e}	carbon-dioxide-equivalent
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUP	Conditional Use Permit
CWA	Clean Water Act
cy	cubic yard
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted sound level
DEIR	Draft Environmental Impact Report
DOT	U.S. Department of Transportation
DTSC	Department of Toxic Substances Control
DWR	California Department of Water Resources
EDR	Environmental Data Resources
EIR	Environmental Impact Report
EMS	Environmental Management System
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
ESA	Federal Endangered Species Act
ESHA	Environmentally Sensitive Habitat Area
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program
FMP	Fisheries Management Plan
FPPA	Federal Farmland Protection Policy Act
Ft/s	feet per second
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
HCRCDD	Humboldt County Resource Conservation District
H ₂ O	water
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
lf	linear feet
Lmax	maximum A-weighted noise level
Lmin	minimum A-weighted noise level
LOS	Level of Service
LRA	Local Responsibility Area
MBTA	Migratory Bird Treaty Act
ml	milliliter
MMT	million metric tons
MPA	Marine Protected Area
msl	mean sea level
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
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic Atmospheric Administration
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWIC	Northwest Information Center
NWS	National Weather Service
OEHHA	California Office of Environmental Health Hazard Assessment
OES	Office of Emergency Services
OHP	California State Office of Historic Preservation
OHV	Off-highway vehicle
OMR	Office of Mine Reclamation
ORV	off road vehicle
PEIR	Programmatic Environmental Impact Report
PG&E	Pacific Gas & Electric
PPM	parts per million
PPT	part per thousand
PPV	Peak Particle Velocity
PRC	Public Resources Code
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board
SAA	Streambed Alteration Agreement

SB	Senate Bill
SCC	State Coastal Conservancy
sf	square feet
SGMA	Sustainable Groundwater Management Act
SLC	California State Lands Commission
SLR	Sea Level Rise
SMAO	Streamside Management Area Ordinance
SMARA	Surface Mining and Reclamation Act
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TP	Timber Production
THPO	Tribal Historic Preservation Officer
TMDL	total maximum daily load
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey
UST	underground storage tank
WBWG	Western Bat Working Group

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. CEQA requires an Environmental Impact Report (EIR) to be prepared when it can be determined that substantial evidence supports a fair argument that significant environmental impacts may occur as a result of a project. The purpose of an 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 (Public Resources Code [PRC] 13, 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 feasible. The environmental effects of a project that must be addressed include the significant effects of the project, growth-inducing effects of the project, and significant cumulative effects.

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 analysis in 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 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 a project, based on information in the Draft EIR, comments received on the Draft EIR, and other information in the administrative record.

This Draft EIR has been prepared by the California Department of Fish and Wildlife (CDFW) for the proposed Ocean Ranch Restoration Project (Project) pursuant to CEQA (PRC Section 21000 et seq.) and the CEQA Guidelines (Title 14 California Code of Regulations [CCR] Section 15000 et seq.).

1.2 Type of Environmental Impact Report

This Draft EIR is a Project EIR, as opposed to a Program EIR, pursuant to CEQA Guidelines Section 15161. A Project EIR is the most common type of EIR, examining the environmental impacts of a specific project. This type of EIR focuses on the changes in the environment that would result from the construction, development, and operation of a specific 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 CEQA when a proposed project may have a “significant” impact on the physical environment. An EIR is defined by the CEQA Guidelines as “... a detailed statement prepared to describe and analyze the significant environmental effects of a project and discuss ways to mitigate or avoid the effects” (Title 14 CCR Section 15362). An EIR must include a description of the physical environmental conditions in the vicinity of a 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.

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 CDFW.

In addition to the Lead Agency, other Responsible and Trustee Agencies may use this document in approving permits or providing recommendations for the Project. For this Project, these agencies may include:

- California Coastal Commission
- State Lands Commission
- North Coast Regional Water Quality Control Board
- State Water Resources Control Board

1.4 Public Scoping Process

On June 13, 2018, CDFW issued an NOP for the Project. The NOP was issued in accordance with the CEQA Guidelines (Title 14 CCR Section 15082) with the intent of informing agencies and interested parties that an EIR would be prepared for the Project. A copy of the NOP can be found in Appendix A. The NOP was circulated between June 13, 2018, and July 16, 2018. A public scoping meeting for the Project was held at the Fortuna River Lodge on July 9, 2018. Comments provided in response to the NOP and during the scoping meeting have been considered and are available upon request.

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 can focus the discussion in the EIR on those potential effects of a 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 (PRC 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

This Draft EIR will be circulated for 47 days, from September 17, 2020 to November 2, 2020, to allow interested individuals and public agencies to review and comment on the document. The document will be available for review at the Humboldt County Planning and Building Department office, located at 3015 H Street, Eureka, California, as opposed to the Humboldt County Public Library which is temporarily closed to the public, and only offering curb side pickup, due to the coronavirus pandemic; and at www.wildlife.ca.gov/Notices. Comments may be submitted in writing via the United States Postal Service or via email. Written comments on the Draft EIR will be accepted by CDFW until 11:59 pm on November 2, 2020. Public agencies, interested organizations and individuals are encouraged to submit comments on the Draft EIR for consideration by CDFW. All written comments should be addressed to:

Gordon Leppig, Senior Environmental Scientist Supervisor
California Department of Fish and Wildlife
619 2nd Street
Eureka, CA 95501
Email: orurestoration@wildlife.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 CDFW provide a clear and meaningful response to each substantive comment.

CDFW will host a virtual public hearing to provide an overview of the Project and to receive public comments on the Draft EIR on October 13, 2020. The public hearing will include a brief presentation by CDFW followed by an open forum where the public may provide verbal or written comments. The public hearing will begin at 6:00 pm and the comment portion of the hearing will close at 7:30 pm. As noted above, the hearing will not have a physical location; it will be a remote-only meeting. Parties interested in participating in the hearing may join via teleconference (901-602-7766; Conference ID 542 558 411#) or virtually through a [Microsoft Teams meeting](#). Additional information on how to participate in the public hearing is available online at <https://www.wildlife.ca.gov/Notices>.

At the end of the public review period, written responses will be prepared for all substantive 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 CDFW prior to making a decision on the Project.

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 Draft EIR and summarizes the environmental impacts and mitigation measures to reduce or eliminate those impacts.
- **Chapter 2, Project Description.** Chapter 2 describes the Project, including the Project objectives, location and setting, background, overall concept and proposed activities, and anticipated permits and approvals.
- **Chapter 3, Environmental Setting, Impacts and Mitigation Measures.** For each environmental resource area (broken out into sections), Chapter 3 describes the existing environmental and regulatory setting, discusses the environmental impacts associated with the Project, identifies feasible mitigation measures to reduce or eliminate those impacts, and provides conclusions on significance.
- **Chapter 4, Alternatives Description and Analysis.** Chapter 4 describes the alternatives to the Project that are being considered to mitigate the Project's environmental impacts while meeting the Project's objectives. This Chapter also identifies the Environmentally Superior Alternative.
- **Chapter 5, Other CEQA Required Sections.** Chapter 5 describes the unavoidable significant impacts, growth-inducing, and irreversible impacts of the Project.
- **Chapter 6, List of Preparers.** Chapter 6 identifies the Draft EIR authors and consultants who provided analysis in support of the Draft EIR's conclusions.
- **Appendices A-B.** The appendices contain the Notice of Preparation and information on wildlife species 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 following provides a brief summary of the comments and issues identified during the scoping process for the EIR.

- Potential impacts on special-status species, including potential impacts during construction and changes in habitat resulting from implementation of the Project;
- Potential impacts associated with short-term and long-term invasive plant management, with particular attention given to the potential effects of herbicide application;
- Inland dune migration resulting from removal of European beachgrass (*Ammophila arenaria*), including long-term management considerations;

- Evaluation of noise and vibration impacts on species;
- Identification of potential cultural resources in the Project Area, and consideration of potential impacts to underground or submerged resources that may not be identified in a records search or cultural resources investigation;
- Analysis of sea level rise on the Project;
- Analysis of greenhouse gases through the identification of thresholds of significance;
- Information and analysis of the hydrology of the area, past and present;
- Potential conversion of habitat types resulting from the Project, such as the loss of freshwater wetlands if tidal hydrology is restored to the Project Area;
- Potential impacts to agricultural resources in the Project Area;
- Potential impacts to levees and dikes outside of the Project Area but within the Project's sphere of influence;
- Potential impacts of continued recreational use of All Terrain Vehicles (ATVs) within the Project Area; and
- Impact of the Project on recreation, including waterfowl hunting, fishing and access along the Sand Road.

All of the substantive environmental issues raised during the scoping process 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, proposed mitigation measures, and post-mitigation significance. Additional information about the impacts and mitigation measures can be found in Chapter 3 of this Draft 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?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact AES-2: In a non-urbanized area, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point).	Less than significant	No mitigation proposed	Not applicable
Impact AES-C-1: Would the Project contribute to a cumulatively significant impact to visual resources?	Less than significant	No mitigation proposed	Not applicable
Agricultural Resources			
Impact AR-1: Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps for the Farmland Mapping and Monitoring Program (FMMP) by the California Resources Agency, to non-agricultural use?	Less than significant	No mitigation proposed	Not applicable
Impact AR-C-1: Would the Project contribute to a cumulatively significant impact to Agricultural Resources or Forestry Resources?	Less than significant	No mitigation proposed	Not applicable
Air Quality			
Impact AQ-1: Would the Project conflict with or obstruct implementation of the applicable air quality plan?	Potentially significant	Mitigation Measure AQ-1	Less than significant after mitigation

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact AQ-2: Would the Project 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?	Potentially significant	Mitigation Measure AQ-1	Less than significant after mitigation
Impact AQ-3: Would the Project expose sensitive receptors to substantial pollutant concentrations?	Potentially significant	Mitigation Measure AQ-1	Less than significant after mitigation
Impact AQ-4: Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	Potentially significant	Mitigation Measure AQ-1	Less than significant after mitigation
Impact AQ-C-1: Would the Project contribute to a cumulatively significant impact to air quality?	Less than significant cumulative contribution	Mitigation Measure AQ-1	Less than significant after Project mitigation
Biological Resources			
Impact BIO-1: Would the Project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS or NMFS?	Potentially significant	Mitigation Measures BIO-1a, HHM-2, HHM-4, WQ-1, WQ-2, BIO-1b, BIO-1c, BIO-1d, BIO-1e, and BIO-1f	Less than significant after mitigation
Impact BIO-2: Would the Project 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 CDFW or USFWS?	Potentially significant	Mitigation Measures BIO-1e and BIO-1f	Less than significant after mitigation

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact BIO-3: Would the Project have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	Potentially significant	Mitigation Measure BIO-3	Less than significant after mitigation
Impact BIO-4: Would the Project 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?	Potentially significant	Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-1d	Less than significant after mitigation
Impact BIO-5: Would the Project conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance?	Potentially significant	Mitigation Measures BIO-1a, HHM-2, WQ-1, WQ-2, BIO-1b, BIO-1c, BIO-1d, BIO-1e, BIO-1f, and BIO-3	Less than significant after mitigation
Impact BIO-C-1: Would the Project contribute to a cumulatively significant impact to biological resources?	Less than significant cumulative contribution	Mitigation Measures BIO-1a through BIO-1f, BIO-2, BIO-3, HHM-2, HHM-4, WQ-1, and WQ-2	Less than significant after Project mitigation
Cultural Resources			
Impact CR-1: Would the Project cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section 15064.5?	Potentially significant	Mitigation Measures CR-1, CR-2, CR-3, and CR-4.	Less than significant after mitigation

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact CR-2: Would the Project disturb any human remains, including those interred outside of formal cemeteries?	Potentially significant	Mitigation Measure CR-5	Less than significant after mitigation
Impact CR-C-1: Would the Project contribute to a cumulatively significant impact to cultural resources?	Less than significant cumulative contribution	Mitigation Measures CR-1 through CR-5	Less than significant after Project mitigation
Geology and Soils			
Impact GEO-1: Would the Project directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving strong seismic ground shaking or seismic-related ground failure, including liquefaction?	Less than significant	No mitigation proposed	Not applicable
Impact GEO-2: Would the Project result in substantial soil erosion or loss of topsoil?	Potentially significant	Mitigation Measures HWQ-1, HWQ-2, and WQ-6	Less than significant after mitigation
Impact GEO-3: Would the Project 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?	Potentially significant	Mitigation Measures HWQ-1, HWQ-2, and WQ-6	Less than significant after mitigation
Impact GEO-4: Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact GEO-5: Would the Project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	Potentially significant	Mitigation Measure GEO-1	Less than significant after mitigation
Impact GEO-C-1: Would the Project contribute to a cumulatively significant impact to geology and soils?	Less than significant cumulative contribution	Mitigation Measures HWQ-1, HWQ-2, WQ-6, and GEO-1	Less than significant after Project mitigation
Greenhouse Gas Emissions			
Impact GG-1: Would the Project generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment?	Less than significant	No mitigation proposed	Not applicable
Impact GG-2: Would the Project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?	No impact	No mitigation proposed	Not applicable
Impact GG-C-1: Would the Project contribute to a cumulatively significant impact relative to GHG emissions?	No impact	No mitigation proposed	Not applicable
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?	Potentially significant	Mitigation Measures HHM-1, HHM-3, and HHM-4	Less than significant after mitigation
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?	Potentially significant	Mitigation Measures HHM-2, HHM-5 and WQ-2	Less than significant after mitigation

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HAZ-3: 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?	Less than significant	No mitigation proposed	Not applicable
Impact HAZ-C-1: Would the Project result in a cumulatively significant impact from increased exposure of the public or environment to hazards or hazardous substances?	Less than significant cumulative contribution	Mitigation Measures HHM-1 through HHM-5 and WQ-2	Less than significant after Project mitigation
Hydrology and Water Quality			
Impact HWQ-1: Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	Potentially significant	Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-2, WQ-6, HHM-2, and HHM-4	Less than significant after mitigation
Impact HWQ-2: Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	Less than significant	No mitigation proposed	Not applicable
Impact HWQ-3: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in substantial erosion or siltation on- or off-site?	Significant unavoidable	Not feasible	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HWQ-4: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	Significant unavoidable	Not feasible	Not applicable
Impact HWQ-5: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would 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?	Potentially significant	Mitigation Measures HWQ-1, HWQ-3, and WQ-6	Less than significant after mitigation
Impact HWQ-6: Would the Project impede or redirect flood flows?	Less than significant	No mitigation proposed	Not applicable
Impact HWQ-7: Would the Project cause an increase in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?	Less than significant	No mitigation proposed	Not applicable
Impact HWQ-8: Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact HWQ-C1: Would the Project contribute to a cumulatively significant impact to hydrology and water quality?	Less than significant cumulative contribution	Mitigation Measures HWQ-1 through HWQ-3, WQ-2, WQ-6, HHM-2, and HHM-4	Less than significant after Project mitigation
Land Use and Planning			
Impact: LU-1: Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	No impact	No mitigation proposed	Not applicable
Impact: LU-C-1: Would the Project contribute to a cumulatively significant impact related to land use and planning?	No impact	No mitigation proposed	Not applicable
Noise			
Impact NOI-1: Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	Less than significant	No mitigation proposed	Not applicable
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	No mitigation proposed	Not applicable
Impact NOI-C-1: Would the Project contribute to a cumulatively significant impact from noise?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
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	No mitigation proposed	Not applicable
Impact PS-2: Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	Less than significant	No mitigation proposed	Not applicable
Impact PS-C-1: Would the Project contribute to a cumulatively significant impact related to public services?	Less than significant	No mitigation proposed	Not applicable
Recreation			
Impact REC-1: Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact REC-2: Would the Project 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	No mitigation proposed	Not applicable
Impact REC-C-1: Would the Project contribute to a cumulatively significant impact to recreational resources?	Less than significant	No mitigation proposed	Not applicable
Transportation			
Impact TR-1: Would the Project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	Less than significant	No mitigation proposed	Not applicable
Impact TR-2: Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	Less than significant	No mitigation proposed	Not applicable
Impact TR-3: Would the Project substantially increase hazards due to geometric design features or incompatible use?	Less than significant	No mitigation proposed	Not applicable
Impact TR-4: Would the Project result in inadequate emergency access?	Less than significant	No mitigation proposed	Not applicable
Impact TR-C-1: Would the Project contribute to cumulatively significant impact related to transportation?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Tribal Cultural Resources			
Impact TCR-1: Would the Project cause a substantial adverse change in the significance of a tribal cultural resource listed or eligible for listing in the California Register of Historical Resources, or determined by the lead agency to be significant pursuant to subdivision (c) of the Public Resources Code section 5024.1?	Potentially significant	Mitigation Measures TCR-1, CR-1, and CR-2	Less than significant after mitigation
Impact TCR-C-1: Would the Project contribute to a cumulatively significant impact to Tribal Cultural Resources?	Less than significant cumulative contribution	Mitigation Measures TCR-1, CR-1, and CR-2	Less than significant after Project mitigation
Energy			
Impact EN-1: Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?	Less than significant	No mitigation proposed	Not applicable
Impact EN-C-1: Would the Project contribute to a cumulatively significant impact to energy resources?	Less than significant	No mitigation proposed	Not applicable
Wildfire			
Impact WF-1: Would the Project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	Less than significant	No mitigation proposed	Not applicable

Impact	Project Significance	Mitigation Measure	After-mitigation significance
Impact WF-C-1: Would the Project contribute to a cumulatively significant impact related to wildfire risk?	Less than significant	No mitigation proposed	Not applicable

2. Project Description

2.1 Project Location and Setting

The Ocean Ranch Unit (ORU) of the Eel River Wildlife Area (ERWA) is located north of the mouth of the Eel River and northwest of the community of Loleta in Humboldt County, California (Figure 2-1 – Vicinity). The ORU encompasses approximately 933 acres (378 hectares) and is generally bounded by the Pacific Ocean to the west, Table Bluff to the north, McNulty Slough to the east and North Bay to the south. The ORU, which is part of the approximate 2,600 acre (1,052 hectare) ERWA, is owned and managed by the California Department of Fish and Wildlife (CDFW) as fish and wildlife habitat and for public recreational uses. The north spit of the Eel River was acquired from the State Lands Commission in 1951 as the first property in the ERWA, and included the dune restoration portion of the present day ORU. The estuary portion of the ORU was purchased by CDFW in 1986.

Historically, much of the area that is now the ORU was estuarine saltmarsh. Sometime between 1916 and 1948, the saltmarsh portion of the ORU (herein referred to as “Ocean Ranch”) was diked, isolated from tidal waters, and drained for pasture through tide gates to McNulty Slough. Once acquired by CDFW, management of Ocean Ranch transitioned out of dairy production and towards shallow freshwater and estuarine wildlife habitat for waterfowl and other native wildlife. At that time, the Ocean Ranch property was divided into five distinct management areas, denoted as Areas A through E, to support wildlife habitat management. In 1994 a levee breach occurred along McNulty Slough (east side of Area A) and caused tidal inundation of Area A. The breach, in combination with subsequent failures of other water control structures within Ocean Ranch and between Ocean Ranch, McNulty Slough and North Bay, resulted in decisions to discontinue management and maintenance of artificial freshwater wetland habitat and have allowed most of the area to revert to saltmarsh or brackish marsh (Ducks Unlimited, Inc. 2015).

Restoration activities proposed under the Ocean Ranch Restoration Project (Project) would occur within an 850 acre (344 hectare) restoration area within the ORU, including approximately 571 acres (231 hectares) of saltmarsh and 279 acres (113 hectares) of coastal dunes along the north spit of the Eel River (Figure 2-2 – Project Area). Restoration activities within the existing saltmarsh are proposed to improve tidal exchange, control invasive plant species (including dense-flowered cordgrass [*Spartina densiflora*] and dwarf eelgrass [*Zostera japonica*]) and restore native tidal marsh habitat. Restoration activities within the coastal dunes would focus on eradication of European beachgrass (*Ammophila arenaria*), an invasive non-native plant species.

Restoration of Ocean Ranch to saltmarsh would reduce the long-term maintenance obligations associated with ongoing management of existing infrastructure, while addressing a critical regional need for enhancement and restoration of tidal estuarine habitats both regionally and within the Eel River estuary. Invasive plant control both within the estuarine and dune restoration areas is proposed to improve

native species diversity and ecosystem function. Dense-flowered cordgrass, which is widespread in Areas A through D, reduces saltmarsh productivity, displaces and outcompetes native saltmarsh vegetation, degrades foraging habitat for and reduces diversity of native birds and migratory waterfowl, reduces invertebrate and algal diversity, and alters saltmarsh morphology and channel habitat by forming dense meadows in open water areas and mudflats (SFEISP 2017). Non-native dwarf eelgrass has the potential to colonize mudflats, bind sediments and impact habitat for shorebirds and mud dwelling and burrowing organisms. European beachgrass, which was established on the north spit of the Eel River in the 1970s and now dominates the dunes along the western boundary of the ORU, forms a dense monoculture that outcompetes native plant communities, contributes to the decline of certain native plants, limits dune function (e.g., limits sand movement), and decreases shorebird nest success by displacing nesting sites and enhancing cover for predators (Pickart 1997). Control and eradication of these invasive plants would improve ecological function and habitat diversity in the restoration area to the benefit of native fish and wildlife species (including State and Federally-listed species), Sensitive Natural Communities, and water quality.

2.2 Project Goals and Objectives

The Project goals are:

1. To restore and expand natural estuarine function in the restoration area, and to assist in recovery and enhancement of habitat for native fish, invertebrates, wildlife and plant species (Goal 1)
2. To restore natural dune function, and to assist in recovery and enhancement of habitat for native species, State and Federally-listed or otherwise sensitive plants, and associated Sensitive Natural Communities (Goal 2)

2.2.1 Goal 1 – Estuarine Restoration

The primary objective of the estuarine restoration component of the Project is to restore the natural tidal prism¹ and improve connectivity of tidal and freshwater habitats within the ORU. Supplementary objectives of Goal 1 include:

- Improve the complexity of the channel network within the ORU relative to existing conditions
- Maintain the existing level of flood protection for adjacent private landowners
- Control invasive dense-flowered cordgrass and other non-native plant species, including dwarf eelgrass
- Improve public access
- Reestablish a permanent elevation benchmark within the ORU to monitor sea level rise and/or tectonic subsidence or uplift

¹ For the purposes of this document, tidal prism is defined as the change in the volume of water covering an area, such as a wetland, between low tide and the subsequent high tide (NAVD88).

- Continue to monitor habitat characteristics, distribution of target populations, and ecosystem processes to evaluate progress towards the goal
- Allow for adaptive management of the ORU as conditions, needs, and goals evolve

2.2.2 Goal 2 – Dune Restoration

The primary objective of the dune restoration component of the Project is to restore Sensitive Natural Communities and dune function within the restoration area. Supplementary objectives of Goal 2 include:

- Eradication of invasive European beachgrass and other invasive plant species found in dune habitats, such as iceplant (*Carpobrotus edulis*) and yellow bush lupine (*Lupinus arboreus*)
- Expand native dune mat community and associated native species, including the State and Federally-listed endangered beach layia (*Layia carnosus*)
- Maintain public access
- Allow for adaptive management and native plant reintroductions as conditions, needs and goals evolve
- Minimize any new non-native plant species invasion through vigilance and early response

2.3 Project Overview

As described above, the Project includes restoration and enhancement of saltmarsh and dune habitats within an 850 acre (344 hectare) restoration area. Restoration and expansion of estuarine functions would be accomplished by implementing actions that increase the tidal prism, improve connectivity between the restoration area, McNulty Slough and North Bay, increase habitat complexity, and control invasive plants. Enhancement of dune function would be accomplished by eradication of invasive plant species, primarily European beachgrass, and reestablishment of native dune mat natural communities.

Table 2-1 Project Component Summary, describes the activities relating to estuarine restoration, invasive plant management and public access. The estuarine restoration activities proposed under the Project include the following:

- Breach external and internal levees
- Lower portions of the external levee along McNulty Slough
- Remove portions of internal levees
- Excavate tidal channels
- Create transitional high marsh habitat
- Construct habitat ridges
- Install ditch plugs and fill internal ditches
- Install large wood habitat structures

Invasive plant management activities include:

- Controlling dense-flowered cordgrass with mowing, grinding, excavation, prescribed burning, and/or herbicide application methods
- Controlling dwarf eelgrass using mechanical excavation and smothering methods
- Eradicating European beachgrass using manual, mechanical, prescribed burning and/or herbicide application methods

Public access improvements include:

- Improving the access road into the restoration area
- Improving the existing parking area
- Constructing a new parking area
- Installing a non-motorized boat put-in
- Establishing a formal trail system
- Installing interpretive signage

Table 2-1 Project Component Summary

Project Component	Description
Estuarine Restoration	
External Levee Breach	Construct four external levee breaches along North Bay and McNulty Slough
Internal Levee Breach	Construct four internal levee breaches within restoration area
Tidal Channel Excavation	Excavate up to 8,520-linear feet (2,515 meters) of internal tidal channels
Levee Lowering	Lower up to 14,650-linear feet (4,465 meters) of external levees along McNulty Slough
Levee Removal	Remove up to 2,460-linear feet (750 meters) of internal levees between Areas B, C, and D, and between Areas A and B
High Marsh Creation	Place soil in lower lying areas to establish higher elevation marsh habitat and improve water conveyance within the restoration area
Habitat Ridges	Place un-engineered spoil piles (i.e., habitat ridges) adjacent to tidal channels to guide formation and accelerate revegetation
Ditch Blocks and Ditch Fill	Install earthen plugs (i.e., ditch blocks) and fill borrow ditches to guide natural channel formation and facilitate accretion of sediment

Project Component	Description
Large Wood Installation	Install large wood structures in tidal channels in Areas A and B, and along the lowered portions of the McNulty Slough perimeter levee, to improve aquatic species habitat
Invasive Plant Management	
Dense-flowered Cordgrass Control	Targeted control of dense-flowered cordgrass on up to 571 acres (231 hectares) using mowing, grinding, excavation, prescribed burning, and/or herbicide application methods
Dwarf Eelgrass Control	Targeted control of dwarf eelgrass populations in McNulty Slough using manual removal and smothering methods
European Beachgrass Control	Targeted control of European beachgrass on up to 279 acres (113 hectares) using manual, mechanical, prescribed burning and/or herbicide application methods
Public Access	
Public Access Improvements	Public access improvements include the following: <ul style="list-style-type: none"> – Improved access road and gate – Improved parking areas – Formalized public trail system – Non-motorized boat put-in – Interpretive signage

2.4 Proposed Project Construction Components

The location of the proposed Project components, which are further described in the following subsections, are illustrated in Figure 2-3 – Proposed Project Components.

2.4.1 Levee Breaches

The Project would construct four new external levee breaches, identified as BR-1 through BR-4, to connect the ORU to North Bay and McNulty Slough. Breach BR-1 would connect Area A to North Bay downstream of the McNulty Slough and Hawk Slough confluence. Breaches BR-2, BR-3, and BR-4 would connect Areas B, C and D, respectively, to McNulty Slough at historic slough locations. Areas A, B, C, and E would be interconnected through four internal levee breaches, designated as BI-1 through BI-4.

The maximum width of external breaches would be between 30 feet (9 meters) and 140 feet (43 meters) wide, with the widest breaches located at BR-1 and BR-2. Internal breaches would have a maximum width between 30 feet (9 meters) and 100 feet (30 meters), with the widest breach at BI-1.

The Project would not affect the existing breach from McNulty Slough into Area A.

2.4.2 Tidal Channels

Up to 8,520 linear feet (2,597 meters) of new tidal channels would be excavated under the Project. Table 2-2 summarizes the maximum dimensions (lengths and widths) planned for these channels. A new 860-foot (262 meter) long channel would be excavated south from BR-1, connecting Area A to North Bay. Similarly, a 2,390-foot (728 meter) long channel would be excavated north from BR-1 to facilitate water conveyance into the lower reaches of Area A. A portion of a remnant slough channel in Area B would be enlarged to connect BR-2 to the northern reaches of Area A and subsequently Area E. A tidal channel would also be extended from BR-3 through Area C to connect to McNulty Slough.

Table 2-2 Channel Dimensions

Channel Location	Channel Length Linear Feet (Meters)	Channel Width at MHHW Linear Feet (Meters)
North Bay	860 (262)	140 (43)
Area A	2,390 (728)	140 (43)
Area B	3,410 (1,039)	100 (30)
Area C	975 (297)	50 (15)
Area E	885 (270)	30 (9)

Notes:

- Units are reported in linear feet (LF) with meters (m) noted in parentheses
- MHHW = Mean higher high water (NAVD88)

2.4.3 Levee Lowering/Removal

Sections of the perimeter levee along the east side of Areas A, B, C and D would either be left intact or lowered. Sections of the perimeter levee left intact would be used to maintain upland refugia and roosting habitat for shorebirds and waterfowl and to provide wave refraction during flood events. Perimeter levees would be either lowered to a crest elevation of eight feet² or lowered to marsh plain elevation, depicted in Figure 2-3 as purple and pink lines, respectively. Portions lowered to a crest elevation of eight feet would be recontoured with varying flat, gradual slopes to provide transitional habitat. Large wood may be placed along some sections of lowered levee to provide high tide refugia for wildlife and a break from wind generated waves coming from the west. Sections of levee lowered to marsh plain elevation would be used to increase tidal exchange. Internal levees between Areas B, C, and D would be removed, including a part of the internal levee separating Areas A and B, to improve tidal exchange and water quality.

² All elevations are in North American Vertical Datum (NAVD) 1988.

2.4.4 High Marsh Elevation Fill

Material excavated to create the tidal channel from BR-1 to North Bay and through the lower portion of Area A may be used to create higher elevation marsh habitat in Area B. Higher marsh elevations may also provide resiliency to sea level rise over time. Alternatively, if the cost or feasibility of moving excavated soils from Area A to Area B is prohibitive (see Section 2.7.2, Construction Equipment and Methodology), excavated material may be relocated to the west side of Area A and/or placed as habitat ridges adjacent to the new tidal channel within Area A.

2.4.5 Habitat Ridges

Habitat ridges are non-engineered earthen spoil piles that are placed along the outside meander of newly constructed channels to guide channel formation and facilitate revegetation. Habitat ridges would be placed along the new tidal channel in Area B, constructed to a crest elevation of approximately seven feet (i.e., approximately the level of mean higher high water [MHHW]), and allowed to develop as high marsh vegetation.

2.4.6 Ditch Block and Ditch Fill

A ditch block is a small plug constructed of compacted earthen fill that is used to block the path of water, help guide natural channel formation, and accelerate accretion of sediment in isolated portions of a ditch. Ditch blocks would be installed at strategic locations in several borrow ditches in Area A and Area B. Some ditches would also be filled to facilitate channel formation.

2.4.7 Large Wood

Large wood would be placed in Areas A and B to increase habitat complexity in tidal channels. Large wood may also be installed along the lowered sections of the perimeter levee of McNulty Slough to increase habitat complexity and provide wave attenuation. All large wood installed onsite would be embedded into the channel bank and/or levee and pinned to limit movement.

2.4.8 Beneficial Reuse of Excavated Sediments

All soil excavated to construct the estuarine restoration Project elements, including soil excavated during levee breaching, levee lowering, and tidal channel excavation, would be reused onsite. Proposed onsite soil reuses include: creating high marsh habitat, filling internal ditches and lower elevation areas, creating habitat ridges, installing ditch plugs, repairing damaged levees and berms that would be lowered to crest elevation, and repairing damaged levees and berms not proposed for removal including but not limited to the location between Areas A and B (northern portion) and within Area E that would not otherwise be removed or lowered. Excess soil not used for one of the above Project components may be spread as a thin layer (less than six inches [15 centimeters] deep) in lower elevation saltmarsh.

In all instances, excavated soil reused onsite would be placed at an elevation to ensure wetland habitat characteristics persist (i.e., mudflats or saltmarsh would be

converted to higher elevation estuarine marsh, not to upland). No fill material would be imported to or exported from the Project Area for estuarine restoration activities.

2.5 Proposed Invasive Plant Management

2.5.1 Dense-Flowered Cordgrass Management

Up to 571 acres (231 hectares) would be treated to remove dense-flowered cordgrass after the estuarine restoration component of the Project is complete using one or more of the methods described in the following subsections. The methods utilized to control dense-flowered cordgrass would be carried out using a series of treatments implemented over time based on seasonality, weather, tides, labor availability, and other factors.

Figure 2-4 – Dense-flowered Cordgrass Cover (2017) illustrates the most recent mapped locations of dense-flowered cordgrass within the Project Area (CDFW 2017). Areas of dense-flowered cordgrass treatment are shown in Figure 2-3, and generally correspond with the locations mapped in Figure 2-4. Proposed treatment methods are generally consistent with those outlined in the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey 2013). The descriptions of these methods below are derived, in part, from the Programmatic Final EIR for the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey 2013 and GHD 2013).

In general, treatments would occur outside the avian nesting window (i.e., between August 1 and March 15). One primary treatment, such as mowing or grinding, and one secondary treatment, such as prescribed burning or herbicide application, would be applied in the first year (Year 1), with follow-up treatments implemented annually thereafter (as needed and as funding allows). It is anticipated that the first treatment of dense-flowered cordgrass would occur after implementation of the estuarine restoration component of the Project has been completed.

2.5.2 Dense-Flowered Cordgrass Treatment Methods

Top Mowing

Top-mowing would involve cutting above-ground stems, leaves, and flowering stalks, typically using handheld gas-powered equipment (e.g., tri-bladed brushcutter, corded weedwhacker) or heavy equipment (e.g., Marshmaster outfitted with mowing attachment). Examples of handheld and heavy equipment are depicted on Image 2-1 – Representative Vegetation Removal Equipment. Biomass generated during and as a result of mowing would be left in place to decompose or to be washed away by the tide; tilled into the soil as mulch during grinding (see below); and/or raked into piles and burned.

Mowing would be used to clear aboveground vegetation in preparation for other treatments, such as grinding or herbicide application, or could be used as a seed suppression measure. In general, handheld equipment would be used to mow areas with low to moderate cordgrass density, limited access, or for seed suppression where handheld equipment can readily remove seedlings without compacting or disturbing too much soil. Heavy equipment would be used to treat larger areas, or areas supporting dense stands of dense-flowered cordgrass.



Image 2-1 – Representative Vegetation Removal Equipment. Handheld brushcutter (left) used to remove above-ground vegetation. Marshmaster (right) used to mow larger areas and grind (via rototiller) dense-flowered cordgrass rhizomes. Photo credit: A. Pickart (USFWS 2017)

Grinding

Grinding involves the use of gas-powered hand tools (e.g., brushcutter), or heavy equipment (e.g., Marshmaster outfitted with a rototiller attachment), to target dense-flowered cordgrass rhizomes below the soil surface. After aboveground vegetation has been removed, the blades of the brushcutter or rototiller are advanced vertically or diagonally into the substrate to grind (macerate) the root crown and rhizomes into small fragments. Grinding depths typically extend three to six inches below the ground surface, with precise depths depending on site conditions and the maturity and density of the dense-flowered cordgrass stand. Follow-up treatments, which are less intensive than the initial grinding, are typically required to address re-sprouts that regenerate from rhizome fragments remaining in the soil.

Tilling

An alternative to grinding is tilling, where a mini-tiller may be used to macerate rhizomes. Mini-tillers, if utilized, are most advantageous when dense-flowered cordgrass cover is less than 50 percent (H.T. Harvey and GHD 2013).

Excavation

Excavation involves complete removal of the plant, including rhizomes, either by hand or using heavy equipment. Excavated material would subsequently be stockpiled and buried onsite, or chipped onsite using brush cutters and used for mulch. In addition, dense-flowered cordgrass may be buried during restoration activities (e.g., in high marsh or habitat ridge areas), as appropriate.

Flaming

Flaming is a form of weed control in which a flame is passed over a plant until it wilts, causing the fluid in the plant's cells to expand and rupture and ultimately killing the plant (H.T. Harvey and GHD 2013). Flaming would utilize handheld propane torches to deliver a small controlled flame to a targeted plant. Since flaming is not an effective method to kill mature dense-flowered cordgrass plants, it would only be used to treat dense-flowered cordgrass seedlings under the Project.

Prescribed Burning

Prescribed fire may be used to remove aboveground plant material (biomass) prior to manual, mechanical, or herbicide applications. All prescribed fire treatments would be conducted in accordance with an approved Burn Plan coordinated with the California Department of Forestry and Fire Protection (CAL FIRE). The Burn Plan would be developed and implemented to ensure that prescribed burns are conducted in compliance with regulations and that the risk of uncontrolled wildfire is minimized. Recommended actions in the approved Burn Plan may include, but are not limited to:

- Evaluation of vegetation community and dominant species, topography, vegetation moisture, wildlife/fisheries habitat, and presence of cultural resources.
- Evaluation of smoke patterns and community sensitivity to prescribed burns.
- Provision and use of adequate fire suppression equipment.
- Use of spark arrestors on internal combustion engines and separation of equipment from flammable materials.
- Advanced notification to the public on the timing and location of prescribed burns.
- Development and implementation of a contingency plan to implement initial actions or trigger the need for additional resources if the prescribed burn exceeds or threatens to exceed the Project Area boundary, or is not meeting the objectives, prescribed burn parameters, minimum implementation organization, smoke management objectives, or other prescribed burn elements stated within the Burn Plan. The contingency plan would identify potential additional resources, should they be needed, and the maximum acceptable response time for those resources.
- The Incident Commander shall have final authority to amend, approve and implement the Burn Plan to achieve the Project objectives related to burning treatments. The Loleta Fire Protection District shall be listed as a Participating Agency in the Burn Plan.

Prescribed burning is the only dense-flowered cordgrass treatment method proposed by the Project that was not previously considered and analyzed in the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey 2013) and associated Programmatic EIR (H.T. Harvey and GHD 2013). Prescribed burning is considered a possible treatment method under the Project due to the large-scale stands of dense-flowered cordgrass that occur in the restoration area, as well as the significant amount of large wood onsite that may make mowing or excavation difficult. Prescribed burning would be used as an initial treatment method to reduce invasive plant biomass. Subsequent manual, mechanical or herbicide applications would be applied following prescribed burning to target removal of underground rhizomes.

Herbicide Application

Eradication of non-native plants through use of herbicide involves the application of herbicide, typically sprayed on plant leaves during the active growing season. Under the Project the herbicide Imazapyr, in conjunction with mechanical treatments (e.g., mowing, grinding), could be used to control dense-flowered cordgrass where other methods have proven ineffective, or where treatment costs would be substantially reduced. Herbicide applications would be performed by a Qualified Applicator, or under the supervision of a Qualified Applicator, in accordance with the manufacturer's recommendations for aquatic use and application. Herbicide would be applied by workers moving through the marsh on foot using backpack sprayers or wick applicators. Alternatively, herbicide would be applied from spray equipment mounted on boats, trucks, or amphibious tracked vehicles. This Project would not include aerial applications of herbicide, such as broadcasting herbicide from helicopters or airplanes.

2.5.3 Dwarf Eelgrass Management

Stands of dwarf eelgrass were observed adjacent to the estuarine restoration area and within McNulty Slough between 2008 and 2011 (K. Ramey pers. comm. 2018). Although recent (2018) surveys of McNulty Slough did not detect the species, if observed in the future, dwarf eelgrass would be removed from McNulty Slough using mechanical control or smothering, as described below.

Control of dwarf eelgrass under the Project would occur on the Ocean Ranch side (west side) of McNulty Slough, from the edge of the perimeter levee to mean low water. As warranted by eelgrass survey observations, control of dwarf eelgrass would likely occur between June and August, concurrent with eelgrass surveys timed to correlate with the flowering period of the species.

2.5.4 Dwarf Eelgrass Treatment Methods

Manual Removal

Manual removal would utilize hand tools (e.g., shovels) to detach rhizomes while the top of the plant is pulled by hand. Plant material would be placed onsite in a stable location above MHHW.

Smothering

Smothering would involve placing burlap fabric on top of stands of dwarf eelgrass and covering the burlap with native silt to smother the rhizomes.

2.5.5 European Beachgrass Management

Up to 279 acres (113 hectares) of European beachgrass would be removed from the dune restoration area with management efforts concentrated in an area defined as the Primary Treatment Area. The Primary Treatment Area is comprised of the northern 2.6 miles (4.2 kilometers) of shoreline and generally corresponds to the 207 acres (84 hectares) having the highest European beachgrass cover (61 percent to 100 percent) in the restoration area, mapped in 2017 and shown in Figure 2-5 – Primary and Secondary European Beachgrass Treatment Areas. The Secondary

Treatment Area includes the southerly one mile (1.6 kilometers) of shoreline and generally corresponds to the 72 acres (29 hectares) having lower European beachgrass cover (less than 61 percent cover) (Figure 2-5).

Removal of European beachgrass within both the Primary and Secondary Treatment Areas would be phased, as described below and summarized in Table 2-3. Treatment methods would generally be used in combination, meaning that a treatment area may be initially burned to remove thatch, followed by an herbicide application to kill rhizomes, with remaining plants manually removed or re-applied with herbicide if they re-sprout after initial treatments.

European Beachgrass Management Phasing

Removal of European beachgrass within the restoration area would be phased temporally and spatially to reduce edge effects and provide native vegetation time to re-establish. Native vegetation is needed to reduce wind speeds, trap sand, and semi-stabilize the dune surface. In general, European beachgrass treatments in both treatment areas would occur between August 1 and March 15 to avoid the nesting bird season. In areas of Western Snowy Plover (*Charadrius alexandrinus*) nesting, treatments would generally occur between September 16 and March 15 unless, based upon survey data and site-specific conditions, CDFW and the U.S. Fish and Wildlife Service (USFWS) approve a wider season of treatment.

Primary Treatment Area

Removal of European beachgrass from the Primary Treatment Area would generally occur over a six-year period in two phases. Phase 1 would treat five approximately 1,312 feet (400 meters) long plots, each spatially separated by approximately 1,312 feet (400 meters), beginning at the northern boundary of the restoration area. Phase 2 would treat an additional five approximately 1,312 feet (400 meters) long plots covering areas not treated during Phase 1. It is important to note that the initial treatments in either phase, as summarized in Table 2-3, could also occur after the avian nesting season (generally after August 1 through March 15), depending on the year and on Western Snowy Plover ground survey results.

In total, approximately 207 acres (84 hectares) of European beachgrass would be targeted for removal from the Primary Treatment Area under both phases.

Table 2-3 provides a conceptual schedule and treatment approach for European beachgrass removal within the Primary Treatment Area.

Table 2-3 Conceptual Schedule and Treatment Methods for European Beachgrass Primary Treatment Area

Year	Activity	Treatment Method (Timeframe)	Initial Treatment Area Size
1	Initial Treatment Phase 1 / Baseline Monitoring	Burn Phase 1 Plots (February-March) Apply Herbicide to Phase 1 Plots (August)	104 acres (42 hectares)
2	Monitoring & Adaptive Management Phase 1	Plant Phase 1 Plots (January) Reapply Herbicide to Phase 1 Plots (as needed) (May)	
3	Initial Treatment Phase 2 / Monitoring & Adaptive Management Phase 1	Manually Remove Re-sprouts from Phase 1 Plots (January) Re-Plant Phase 1 Plots (as needed) (January) Burn Phase 2 Plots (February-March) Apply Herbicide to Phase 2 Plots (August)	103 acres (42 hectares)
4	Monitoring & Adaptive Management Phase 2	Plant Phase 2 Plots (January) Reapply Herbicide to Phase 2 Plots (as needed) (May)	
5	Monitoring & Adaptive Management Phases 1 & 2	Manually Remove Re-sprouts from Phase 1 & 2 Plots (January) Re-Plant Phase 2 Plots (as needed) (January)	
6	Monitoring & Adaptive Management Phases 1 & 2	Manually Remove Re-sprouts from Phase 1 & 2 Plots (January)	

Secondary Treatment Area

Similar to the Primary Treatment Area, removal of European beachgrass from the Secondary Treatment Area would occur over several years and could utilize all of the treatment methods noted in

Table 2-3 and described in Section 2.5.6 below (i.e., prescribed burning, herbicide application, manual removal, and mechanical removal). Treatments would take advantage of natural breaks in the plant communities and would likely reflect a “spot treatment” approach, rather than removal of European beachgrass from contiguous plots. It is anticipated that invasive plant management within the Secondary Treatment Area would occur after management of the Primary Treatment Area (which is considered the priority treatment area), and may need to be modified (scope, location) to account for natural fluctuations in the morphology of the Eel River estuary.

2.5.6 European Beachgrass Treatment Methods

Prescribed Burning

Prescribed burning may be used to remove aboveground biomass prior to manual, mechanical, or herbicide application. All prescribed burn treatments would be conducted in accordance with an approved Burn Plan coordinated with CAL FIRE. The Burn Plan would be developed and implemented to ensure that prescribed burns are conducted in compliance with regulations and that the risk of uncontrolled wildfire is reduced to low. Recommended actions to include in the Burn Plan would be similar to those summarized under “Prescribed Burning” in Section 2.5.5.

Herbicide Application

Similar to the estuarine restoration portion of the Project, the herbicide Imazapyr could be applied in the Primary and Secondary Treatment areas within the dune restoration portion of the Project to kill rhizomes after prescribed burning, or to selectively treat target re-sprouts after mechanical or manual removal efforts. Herbicide applications would be performed by a Qualified Applicator or under the supervision of a Qualified Applicator, in accordance with label requirements. Herbicide would be applied using backpack sprayers or wick applicators, depending on the need for selective control. The Project would not include aerial applications of herbicide (broadcast using helicopter or airplane).

Manual Removal

Manual removal would utilize hand tools (e.g., shovels) to detach rhizomes while the top of the plant is pulled and piled by hand. Excavation using hand tools would extend less than two feet (0.6 meters) below the ground surface, and sidecast plant material would either be burned in piles or allowed to decompose on site. After initial removal, work crews would return during the growing season to remove any plants that re-sprout from remaining rhizomes. Maintenance treatments would likely occur for two growing seasons. Additional maintenance treatments beyond the first and second growing seasons would occur, as needed, based on the abundance of re-sprouting plants.

In general, hand removal would be utilized in the most sensitive areas, such as areas proximate to known populations of beach layia, and to remove plants that re-sprout after other treatment methods have been employed.

Mechanical Removal

Mechanical removal would utilize heavy equipment (bulldozers or excavators) to excavate and bury European beachgrass, typically under three to six feet (0.9 to 1.8 meters) of sand. Alternately, equipment, such as a bulldozer with a wing ripper, could be used to “rip” rhizomes below the surface.

Mechanical removal could be used in areas with dense European beachgrass cover, and that are accessible, relatively flat, and without substantial native or special status plant resources.

Additional invasive plants which may be removed include but are not limited to: pampas grass (*Cortaderia selloana*) and Himalayan blackberry (*Rubus armeniacus*). The same techniques proposed to remove dense-flowered cordgrass and European beachgrass would be used to remove the invasive plant species listed above, with the addition of grubbing via hand tools to remove Himalayan blackberry, when necessary.

2.6 Public Access Elements

The Project includes improvements to an existing access road and parking area, construction of a new parking area, construction of a non-motorized multi-use trail system, and construction of a non-motorized boat put-in. These improvements would be designed and located to be wildlife-friendly.

2.6.1 Access Road and Parking Area

An existing gravel parking area is located at the north end of an existing gravel road that leads south from Table Bluff Road to the estuarine restoration area. Under the Project, both the existing parking area and road would be improved by grading and resurfacing; the road would be resurfaced with asphalt or pervious concrete and the existing parking area with gravel. A footpath running parallel to the roadway would be surfaced with gravel. A new asphalt or pervious concrete parking area would be established near the south end of the access road. The new parking area would contain six to ten parking spaces to accommodate vehicles and offer connection to the proposed non-motorized multi-use trail system. An American with Disabilities Act (ADA)-accessible parking space with a van pull out area would also be provided. Three concrete picnic tables and a concrete pad would be installed adjacent to the parking area.

Currently, there is a locked gate that restricts vehicle access into the estuarine restoration area from Table Bluff Road. Under the Project, the gate would be replaced and operated to provide access during daylight hours. A kiosk and interpretive display would be located in the parking area. A second gate, kiosk and interpretive display would be installed at the entrance to the sand road off of South Jetty Road.

2.6.2 Non-motorized Multi-Use Trail System

A 0.5-mile (0.8 kilometer) segment of the modified levee separating Areas A and B would be established and managed as a pedestrian, equestrian and bicycling trail, extending from the new parking area to the levee breach between Areas A and B.

A second 0.25-mile (0.4 kilometer) trail would be established to extend from the new parking area to the sand road, utilizing the modified levee between Areas A and E. This trail would provide access between the estuarine restoration area and the Pacific Ocean. Construction of the trail system includes a bridge crossing having a span of about 50 feet (15 meters) over the BI-3 breach, as well as a box culvert crossing at BI-4. The trails would also be ADA-accessible and would be surfaced with graveled rock.

2.6.3 Non-motorized Boat Put-in

A non-motorized boat put-in would be constructed in Area B near the new parking area and trail system. Depending on funding, the put-in would either consist of a floating dock with gangway ramps, or a simple foot accessible ramp with all-weather gravel surfaces sloped from the trail system to the water. The non-motorized boat put-in would be ADA-accessible and would be surfaced with pervious concrete or gravel.

The put-in would provide boaters with water access during most tides and would connect to the tidal channel system in Area B. The non-motorized boat put-in would complement the existing boat launch at the end of Reservation Road, whose use is limited by the lack of available parking and high tide-only boat access.

2.7 Project Implementation

2.7.1 Site Access and Staging

Primary access to the Project Area during construction of the estuarine restoration portion of the Project would be from the existing single-lane gravel road on the north end of the ORU. This road would be improved (graded, resurfaced) as part of the Project to provide construction access and to improve recreational access after the Project is complete. The north end of the access road terminates at Table Bluff Road, a two-lane paved road maintained by Humboldt County. From the northern extent of the Project Area Table Bluff Road extends west towards Table Bluff County Park and South Jetty Road (which provides beach access to the Pacific Ocean), and east towards Loleta and California State Route 1. Construction equipment and materials would be transported to the restoration areas via these roads.

Construction equipment would be staged in the improved parking area, and the adjacent uplands north of the estuarine restoration area (Figure 2-3). Construction equipment would access individual work sites from the top of existing levees and berms, where possible, and along the sand road, where necessary. Low-ground pressure equipment, and/or equipment staged from barges, would be used in discrete areas that are not accessible from existing levees or berms. Construction equipment would not be stored in or near water or inundation areas. Invasive plant management activities would utilize the same access roads and parking areas as those described for the estuarine restoration component of the Project. All areas disturbed by temporary staging and access would be de-compacted and naturalized, as needed, prior to Project completion.

2.7.2 Construction Equipment and Methodology

Table 2-4 lists the type and quantity of equipment that may be utilized during construction of the estuarine restoration component of the Project. The equipment listed in Table 2-4 would be the primary noise generating equipment and emission sources during construction. Construction is anticipated to occur over two seasons. After construction of the estuarine restoration portion of the Project is complete, noise generating equipment would be limited to heavy machinery (e.g., mowers) and handheld tools (e.g., backpack sprayers) for invasive plant management activities and vehicles for implementing ongoing monitoring, management or maintenance activities. Sources of noise and emissions would generally be infrequent and limited in duration.

Table 2-4 Estimate of Equipment Needed for Project Construction

Equipment Type	Estimated Quantity
Excavators (Conventional and/or Amphibious)	2-4
Dozers	2-4
Loaders	1-3
Dump Trucks	2-8
Small Tractors	1-3
Compactors	1-2
Graders	1-2
Water Trucks	1-2
Hydraulic Dredge	1
Crane	1
Pumps	1-2

Proposed excavation work in Areas B, C, and D would occur in a dry or dewatered condition. These areas would most efficiently be dewatered by repairing or isolating the existing water control structure at the BR-2 breach location and draining work areas passively at low tides³. Existing open culverts in Areas C and D would be removed to ensure no additional tidal inflow. Pumps may be required to remove remaining water that won't discharge through gravity. Cofferdams would be needed to isolate the work area around BI-3 due to tidal influence from Area A to the north. Earthen cofferdams constructed of native soils and/or sheetpile walls pushed into the subsurface would be utilized to isolate the work area around BI-3 from tidal water.

A combination of pumps and/or gravity diversion pipes screened to exclude fish entrainment would be used to route flow around the active work area. A crane staged on the access road to the north would be used to place the bridge at BI-3 on the constructed abutments. Excavators and dump trucks would work from existing

³ Repair or isolation at this tide gate could include installation of a flap gate, or otherwise blocking the inlet with an inflatable bladder, plywood, or sheetpile.

levees or on wetland mats to prevent compaction of saltmarsh within Areas B, C, and D.

Area E is currently isolated from tidal influence by a water control structure at the proposed BI-4 breach location; however, a freshwater spring on Table Bluff keeps the unit shallowly flooded year round. As a result, it is likely that pumping will be required to dewater Area E prior to and during construction. Cofferdams, constructed of earthen berms or sheetpile walls, would be used to isolate the work area associated with the BI-4 breach and box culvert.

Excavation work in Area A, including construction of the tidal channel from BR-1 to North Bay, would occur using either a hydraulic dredge extending from North Bay into Area A (preferred method), or excavators between North Bay and BR-1 (secondary method).

The preferred method would utilize a hydraulic dredge to excavate the tidal channel extending from North Bay into Area A. The hydraulic dredge would be mounted on a barge and likely mobilized to the work area from either the boat launch at Cock Robin Island Road or the south end of Reservation Road. The hydraulic dredge would utilize a cutter head and pump to excavate a new tidal channel north from North Bay, moving the slurry of water and soil to the disposal sites in Area B using an aboveground pipeline. A temporary berm would be constructed across Area B to contain and decant the slurry. Decanted water would be allowed to flow through a series of weirs, where it would ultimately be discharged to McNulty Slough through the water control structure at the BR-2 breach.

If it is cost prohibitive or technically infeasible to mobilize a hydraulic dredge into North Bay, a secondary method would employ excavators and dump trucks to excavate the new tidal channel between North Bay and BR-1. Equipment would use the sand road to access the levee system along the south end of the estuarine restoration area. A temporary road built on wetland mats would be used to allow equipment access to North Bay over the salt marsh, where an excavator would offload sediment to dump trucks for disposal along the west side of the estuarine restoration area. The tidal channel from BR-1 into Area A would be constructed using an amphibious excavator. Soils removed from the interior tidal channel would be used to form habitat ridges adjacent to the new alignment. Silt curtains may be installed to limit the delivery of turbid water outside the immediate work area, if feasible.

Construction activities would be conducted in compliance with applicable local, state and federal requirements and in a manner that minimizes disturbance to adjacent properties and disruption to traffic. Minimal traffic control is expected for this Project because the vast majority of the Project Area has no roads, is not drivable due to wetlands and topography, and vehicles are off limits. Some limited traffic control in the form of temporary construction-related vehicle exclusions zones would likely be required for public safety.

As described above, invasive plant management activities would typically occur from late summer to early spring, depending on the treatment method utilized and whether heavy machinery or handheld equipment are utilized. Refer to Section 2.5,

Proposed Invasive Plant Management, for a treatment-specific description of proposed equipment and methods.

2.7.3 Project Schedule and Duration

Construction

Construction of the estuarine restoration component of the Project would be phased into two construction seasons based on available funding and sequencing earthwork. Construction work may occur year-round, if feasible, but would likely occur primarily between May and October. Construction is currently anticipated for years 2021 and 2022.

Initial phases of construction include isolating Areas B, C and D and constructing interior site elements, such as channel excavation, habitat ridges, and ditch blocks. Public access elements would likely be implemented concurrent with the interior site work. Subsequent phases include excavation of the BR-1 breach and channel to North Bay, followed by breaching and lowering levees throughout the remainder of the site.

Construction would generally occur between the hours of 6:00 AM and 6:00 PM, Monday through Saturday. It is anticipated that between five and 20 construction workers would be present within the estuarine restoration area at any given time. Up to 20 motor vehicles would access the construction area each day.

Invasive Plant Management

Invasive plant management activities including the removal of invasive dense-flowered cordgrass and, if present, dwarf eelgrass would occur after the estuarine restoration portion of the Project is complete, consistent with the timing and sequencing described in Sections 2.5.1 through 2.5.4. Invasive European beachgrass management would occur independent of the estuarine restoration portion of the Project, consistent with the timing and sequencing described in Sections 2.5.5 and 2.5.6.

Ongoing management of invasive plant species would include:

- Dense-flowered cordgrass – Removal of up to 10 acres (4 hectares) per year of dense-flowered cordgrass from the estuarine restoration area, as needed and contingent on funding. Maintenance of dense-flowered cordgrass could utilize any of the treatment methods described in Section 2.5.2, but would likely focus on targeted mowing, herbicide application, and flaming.
- Dwarf eelgrass – Any population of dwarf eelgrass observed during potential future eelgrass surveys of McNulty Slough would be removed manually or by smothering, as described in Section 2.5.4.
- European beachgrass – Removal of up to 10 acres (4 hectares) per year of European beachgrass from the Primary and/or Secondary Treatment Areas, as needed and contingent on funding. Maintenance of European beachgrass could utilize any of the treatment methods described in Section 2.5.6, but would focus on manual removal and possibly herbicide application.

It is assumed that ongoing invasive plant management activities would occur for up to ten years or as long as needed to achieve control and/or eradication.

Maintenance

Ongoing maintenance activities may be necessary to assure the long-term hydraulic and ecological functions of the Project, and to continue to support safe and reliable access to the restoration area by the public. The following maintenance actions are anticipated after the Project is constructed:

- Minor maintenance of built infrastructure, including:
 - Grading and/or resurfacing portions of the access road and parking area (once in 10 years)
 - Cleaning debris from the non-motorized boat put-in and bridges on the trail (annually)
 - Mowing vegetation from the trail system (semi-annually)

Monitoring activities are considered a subcomponent of Project maintenance. Specific monitoring activities are to be determined, however would generally include observations of plant species and measurements to determine whether the Project has been successful in improving habitat conditions for special-status plants and wildlife. The frequency of monitoring will be determined during Project permitting. Observations would occur on foot and would not include the use of heavy machinery.

2.8 Required Permits and Approvals

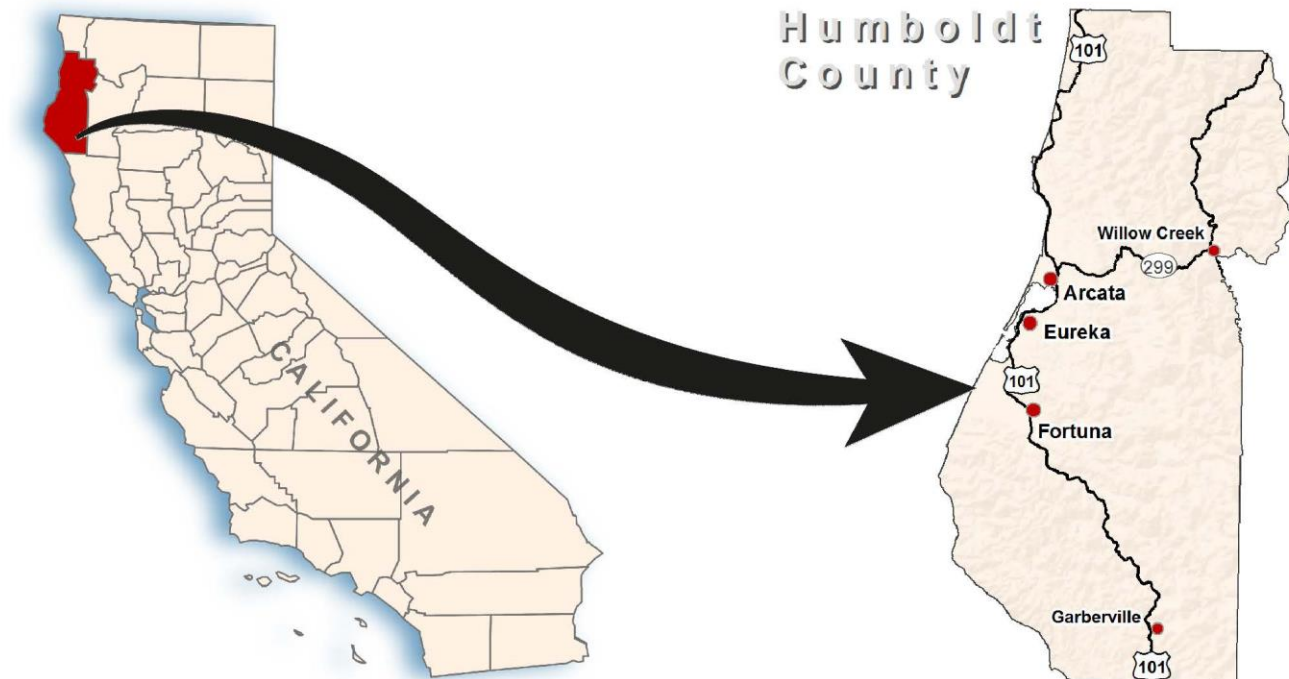
The Project would likely require the following permits and/or approvals:

- California Coastal Commission – Coastal Zone Management Act (CZMA) Federal Consistency Determination or Coastal Development Permit
- CDFW – Lake and Streambed Alteration Agreement
- CDFW – California Endangered Species Act (CESA) Incidental Take Permit or 2081(a)
- California State Historic Preservation Office – National Historic Preservation Act (NHPA) Section 106 Review
- North Coast Regional Water Quality Control Board – Clean Water Action (CWA) Section 401 Water Quality Certification and Porter-Cologne Waste Discharge Requirements
- State Lands Commission – Lease or Lease Amendment
- National Marine Fisheries Service – Federal Endangered Species Act (ESA) Consultation, Magnuson-Stevens Fishery Conservation Management Act Essential Fish Habitat Assessment
- U.S. Army Corps of Engineers – CWA Section 404 Permit and/or Rivers & Harbors Act Section 10 Permit
- USFWS – ESA Consultation

The Project is being funded in part by the National Oceanic and Atmospheric Administration's (NOAA) Restoration Center through a Community-Based Restoration Program (CRP) Grant. As a federal funding agency, the NOAA Restoration Center is completing an evaluation of the Project under the National Environmental Policy Act (NEPA) and anticipates appending the Project to the Final Programmatic Environmental Impact Statement for Habitat Restoration Activities Implemented Throughout the Coastal United States (NOAA Restoration Center 2015). The NOAA Restoration Center is also acting as the lead federal agency responsible for compliance with the CZMA, NHPA, and ESA.

2.9 References

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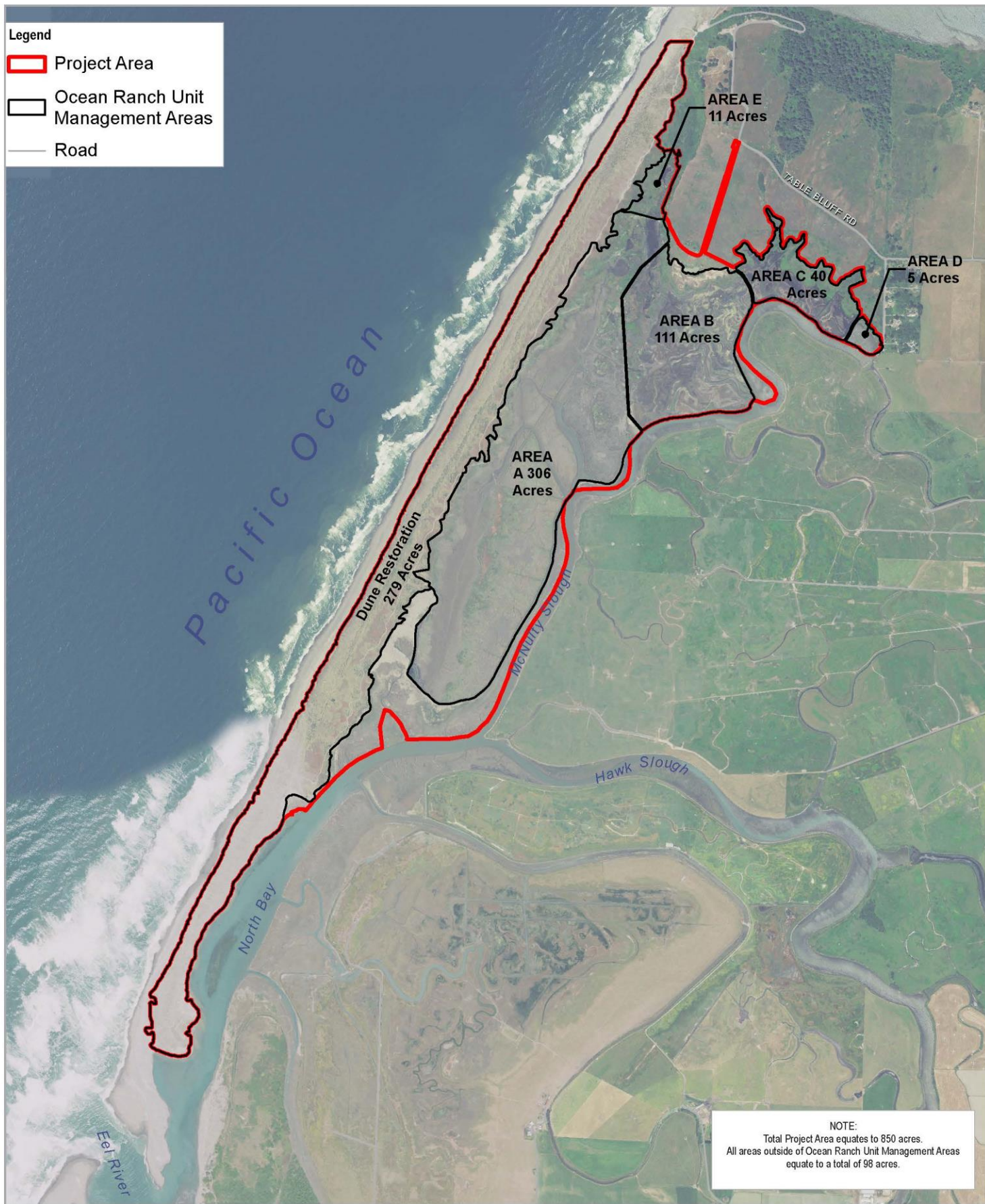


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Vicinity Map

FIGURE 2-1



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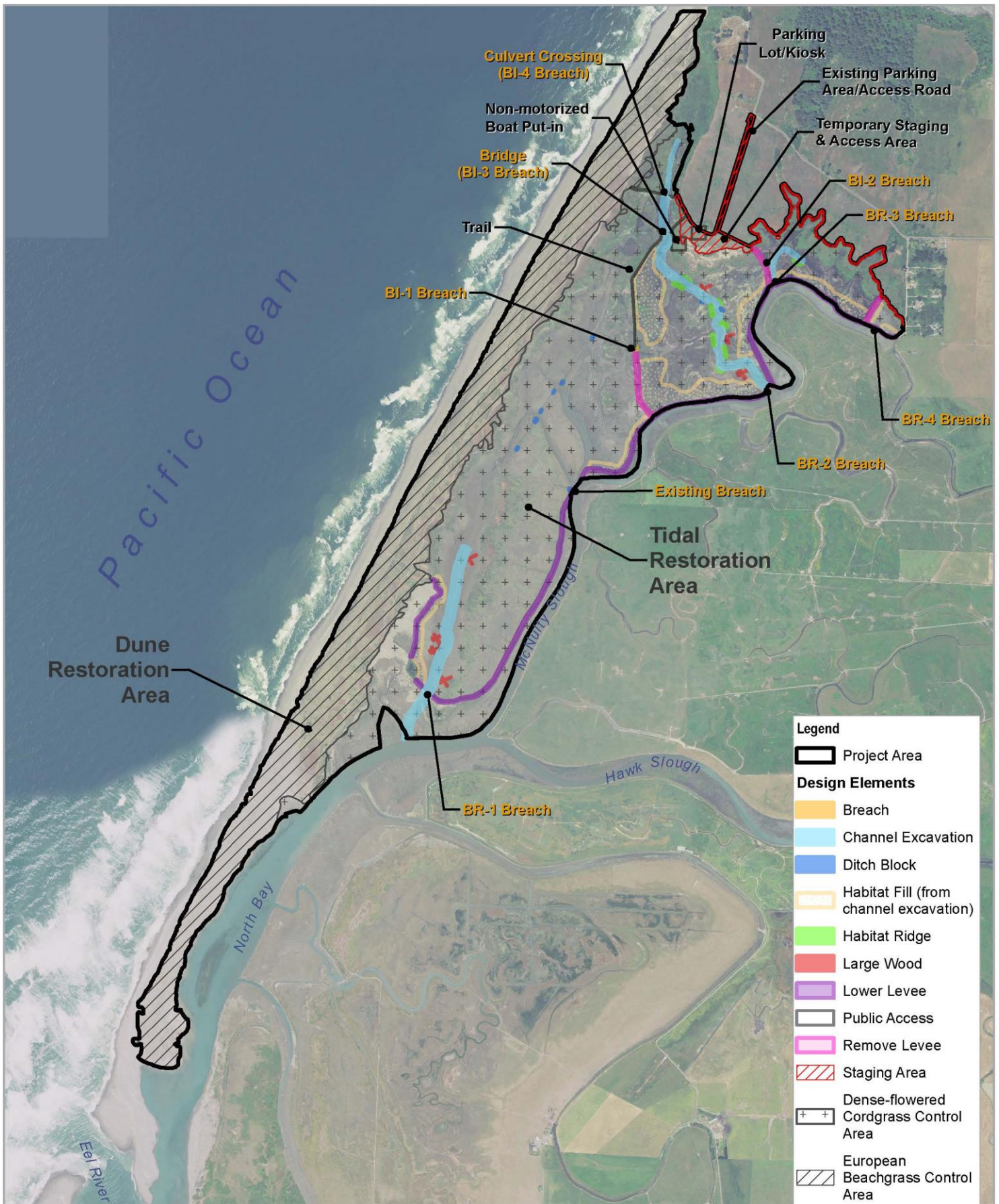
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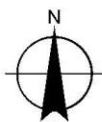
Project Area

FIGURE 2-2



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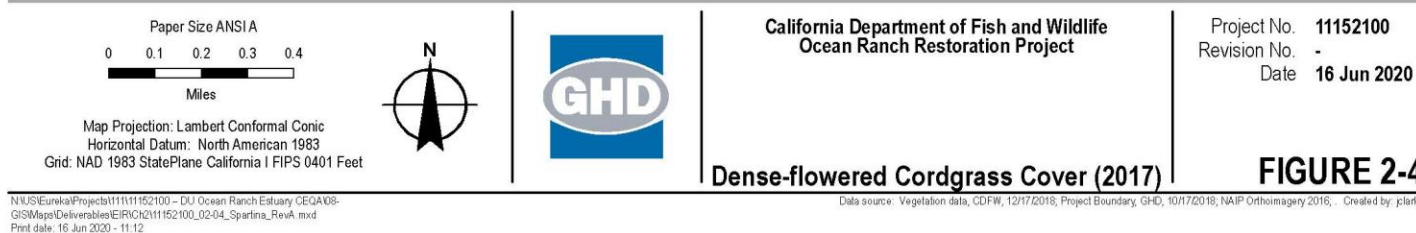
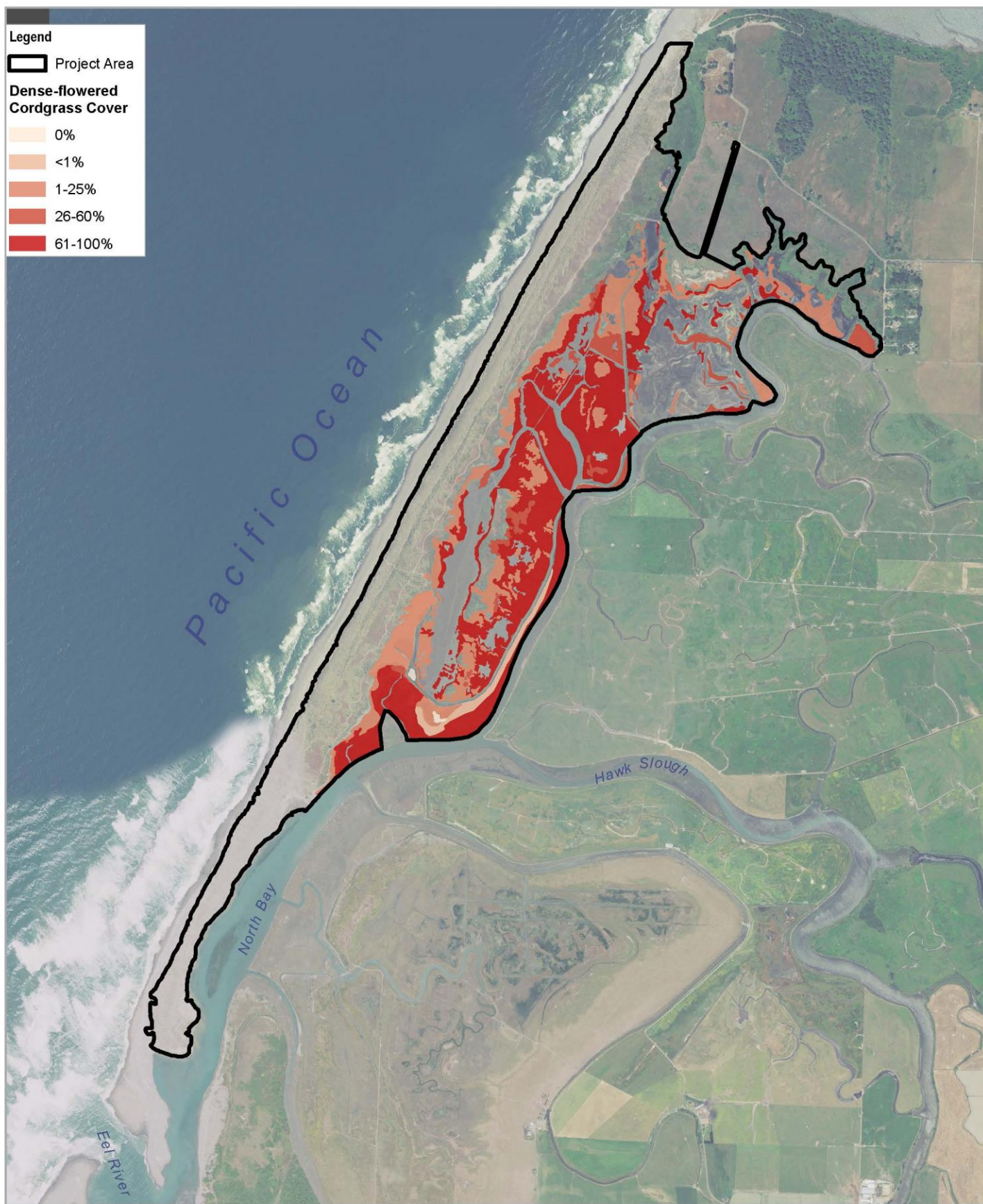


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Proposed Project Components

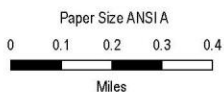
FIGURE 2-3



Legend

 Project Area

 European Beachgrass Treatment Area



California Department of Fish and Wildlife
Ocean Ranch Restoration Project

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**Primary and Secondary
European Beachgrass Treatment Areas**

FIGURE 2-5

3. Environmental Setting, Impacts, and Mitigation Measures

Scope of Analysis

This Draft EIR analyzes the potential effects of the Ocean Ranch Restoration Project (Project) on the environment under the applicable environmental resource categories listed in the CEQA Initial Study Checklist (Appendix G of the 2019 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 Agriculture and Forestry 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 Noise
- 3.12 Public Services and Utilities
- 3.13 Recreation
- 3.14 Transportation
- 3.15 Tribal Cultural Resources
- 3.16 Energy
- 3.17 Wildfire

Each section of Chapter 3 contains the following elements:

Study Area

This subsection identifies the study area used to describe the environmental setting and to complete the impact analysis (i.e., the geographic scope of the analysis used to consider direct and indirect impacts). In some instances, the study area has the same footprint as the Project Area – i.e., the 850-acre (344 hectare) restoration area where estuarine and dune restoration activities are proposed under the Project, as well as areas proposed for construction access and staging. For some resource

areas, the study area has been expanded to allow for consideration of impacts that may occur outside the Project Area boundary. For example, the study area for Section 3.14 (Transportation), considers transportation conditions of roadways that provide access to the Project Area from the nearest state highway.

Setting

This subsection presents a description of the existing physical environmental conditions within the study area for the specific resource area evaluated (see above). The setting describes existing conditions at an appropriate level of detail to provide a baseline by which to evaluate 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. For many resource areas, local regulations do not apply because the entirety of the Project Area is state-owned or leased. In instances where local regulations do apply, such as regulations specific to the use of County roads to access the Project Area, they are described in this subsection.

Evaluation Criteria and Significance Thresholds

This subsection provides the significance thresholds for evaluation of environmental impacts. The significance thresholds are based on the 2019 CEQA Guidelines Appendix G.

Methodology

The methodology subsection discusses the approach to the impact 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.

Impacts

As described above, 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 study 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, even after mitigation has been included to reduce the impact. Under this determination, no additional feasible mitigation is available to reduce the impact to a less-than-significant level.

Mitigation Measures

Environmental impacts are numbered in this Draft EIR using the section number followed by sequentially numbered impacts. Mitigation measures are numbered to correspond to the impact numbers; for example, Mitigation Measure AES-1 would address Aesthetics Impact AES-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 AES-1a and Mitigation Measure AES-1b would both apply to Impact AES-1). In instances where mitigation measures have been brought forward from the Programmatic Final EIR for the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey 2013 and GHD 2013), the mitigation measure number from that document has been utilized.

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.

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.

Approach to Cumulative Impact Analysis

Two approaches to cumulative impact analyses 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 state-wide 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 Draft EIR, the cumulative impact analysis utilizes the list approach. In addition, the analysis of cumulative impacts uses relevant planning documents,

where they provide an appropriate evaluation. Table 3-1 lists relevant projects used in the cumulative impact analysis for each environmental resource topic.

List of Relevant Projects

Table 3-1 provides a list of past, 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. See Figure 3.0 – Location of Cumulative Projects, for a map of the project locations listed below.

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: tidal wetland restoration on the 444-acre (180 hectare) Riverside Ranch property owned by the CDFW; erosion-reduction projects on private lands in the Wildcat Hills; excavation of a new Salt River channel and installation of large wood, mostly on private lands; and long-term adaptive management/maintenance.	Partially constructed and under construction (summer months), estimated completion by 2020.	Humboldt County near the City of Ferndale, California, approximately 2.5 miles (4 kilometers) south of the Project Area. The Salt River project area extends from approximately 1,800 linear feet (589 meters) upstream of the Salt River's confluence with Williams Creek downstream to the Salt River's confluence with Cut-Off Slough.
Cannibal Island Restoration Study	CDFW and private landowners have grant funding to explore future wetlands restoration and habitat enhancement potential.	Project is in the planning phase.	Humboldt County; southerly and adjacent to Project Area.
Ongoing maintenance in vicinity of southern spit of Eel River mouth within the shared dike basin	Specific activities are currently unknown but could include existing berm and tide gate/culvert repairs or replacement.	Ongoing	Humboldt County, located within the southern estuary of the Eel River. Activities are located outside of the dormant Eel River Estuary and Centerville Slough

Environmental Setting, Impacts and Mitigation Measures

Project Name	Project Description	Estimated Construction Schedule	Project Location
			Enhancement project area but within the shared diked sub-basin, approximately 2.5 miles (4 kilometers) south of the Project Area.
Russ Property Levee Stabilization	Project to include stabilization of existing earthen levee on the east side of McNulty Slough.	The project is designed and awaiting completion of necessary permits.	On the east side of McNulty Slough, adjacent to the Project Area.
Wetland Reserve Program or Floodplain Easement Projects	Future project activities on Wetland Reserve Program (WRP) or Floodplain Easement properties include improved flood management, wetlands restoration, fish and wildlife habitat improvements and general agricultural property enhancements.	Projects expected to take place over the next three years (2021-2023).	Projects are located throughout the Eel River estuary. The closest WRP project is located approximately 0.8 mile (1.3 kilometers) east of the Project Area.
Smith Creek Tide Gate Improvement Project	The project includes the removal of an existing failed tide gate structure with a new improved structure funded through the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Environmental Quality Incentives Program.	The project is planned to be constructed in 2020 or 2021.	Humboldt County, located northwest of Ferndale, approximately 4 miles (6.4 kilometers) south of the Project Area.
Upslope Sediment Reduction Projects & Implementation of Best Management Practices (BMP)	Sediment reduction/erosion control actions in the upper Salt River watershed. 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	Ongoing	Humboldt County, specifically located in the Ferndale area, approximately 6 miles (9.6 kilometers) south of the Project Area. Not shown on Figure 3.0.

Project Name	Project Description	Estimated Construction Schedule	Project Location
	intended to improve water quality in the lower Eel River, while enhancing hydrologic function (i.e., reduced turbidity/sediment load and decreased sediment deposition) in the lower watersheds. Most projects are landowner led with technical and cost share assistance from the NRCS.		
Lower Eel River Gravel Extraction Area	Includes seasonal extraction of various volumes of aggregate from six gravel 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	Humboldt County, located between Fernbridge and the lower Van Duzen River, located east of the Project Area.
Williams Creek Restoration Study	Data is being gathered on environmental conditions within William Creek watershed including geomorphic assessments, stream gaging, and biological conditions. The restoration study may lead to a project to improve drainage and improve habitat connectivity.	The project is in the data collection phase.	Humboldt County, approximately 5 miles (8 kilometers) south of the Project Area.
Francis Creek Bridge Installation	Project led by Humboldt County which replaced an undersized culvert with a bottomless arch culvert to restore fish passage and improve hydrologic function. Funded through CDFW's Fisheries Restoration Grant Program.	Completed in 2015.	South of the Project Area, located in Port Kenyon.
Table Bluff Road Erosion Control BMPs	Future project led by Humboldt County and the Bureau of Land Management (BLM) to	Expected to be completed by 2022.	North of the Project Area, along Table Bluff Road and South

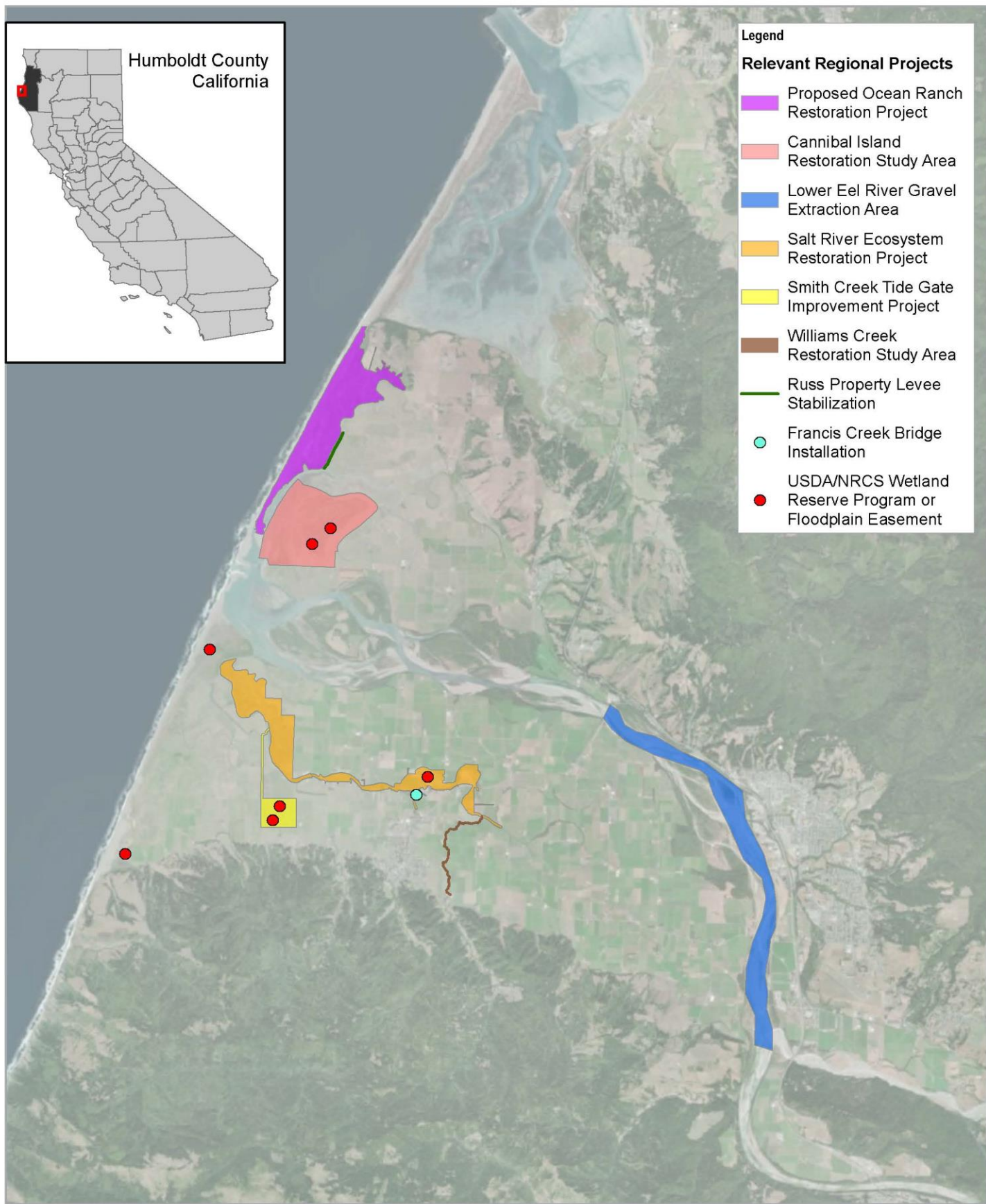
Project Name	Project Description	Estimated Construction Schedule	Project Location
	reduce erosion along Table Bluff Road.		Jetty Road. Not shown on Figure 3.0.
Gate Installation Project	Potential project led by CDFW to manage access to Ocean Ranch and the BLM's South Spit Recreation Area. Project could include the installation of a gate, small parking area and kiosk on Table Bluff Road approximately 0.25 miles west of the Indianola Reservation Road intersection. Access hours are anticipated to be two hours before sunrise, to two hours after sunset.	The potential project is in the planning stage.	Approximately 0.25 mile (4 kilometers) west of the intersection between Table Bluff Road and Indianola Reservation Road. Not shown on Figure 3.0.
Potter Valley Project Modifications	Potential decommissioning or modification of the Potter Valley Project, which may result in fisheries and water quality benefits to the downstream Eel River, including the estuary.	Major project modifications or decommissioning unlikely to occur before 2030 or later.	Upper Eel River basin, inclusive of Van Arsdale Dam, Scott Dam, and the Potter Valley Diversion to Sonoma County, California.

Sources: California State Coastal Conservancy 2016
 Shortridge pers. comm. 2018
 Blodgett pers. comm. 2018
 Heppe pers. comm. 2018
 Bartolotta pers. comm. 2018

References

- Bartolotta, C. 2018. Wildlife Habitat Supervisor II, California Department of Fish and Wildlife (CDFW). Email and phone communication regarding gate at Table Bluff County Park. October 8.
- Blodgett, V. 2018. Planwest Partners for the City of Ferndale. Email communication inquiring about potential projects in the Ferndale vicinity to be considered in cumulative impact analysis. September 28.
- California State Coastal Conservancy (SCC), 2016, Eel River Estuary and Centerville Slough Enhancement Project, Draft Environmental Impact Report.

- Heppe, C. 2018. Assistant Field Manager, Bureau of Land Management (BLM). Email communication regarding gate at Table Bluff County Park. October 4.
- Shortridge, T. 2018. Planner, Humboldt County. Email communication about potential projects in Humboldt County to be considered during cumulative impact analysis. September 27.



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**Ducks Unlimited
Ocean Ranch Restoration Project**

Project No. **11152100**
Revision No. **-**
Date **June 2020**

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

Location of Cumulative Projects

FIGURE 3.0

3.1 Aesthetics

This section evaluates the potential impacts related to aesthetics and visual resources during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass, (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The aesthetics study area extends beyond the Project Area boundary and includes views of the Project Area from Table Bluff County Park and Table Bluff Road to the north, and views of the Project Area from Copenhagen Road to the east.

3.1.1 Setting

The following text describes the existing visual character of the aesthetics study area. The descriptions of existing conditions are accompanied by photographs of representative views taken during a site visit on August 27, 2018.

Regional Visual Character

According to Humboldt County's General Plan, scenic beauty is the most notable characteristic of Humboldt County for visitors and one of the most appreciated attributes among residents. Forested hillsides, working agricultural land, river corridors, and the coast are some of the scenic resources that require protection to maintain the county's characteristic scenic beauty and unique sense of place (Humboldt 2017).

Visual Character of the Project Area

Views of the Project Area are of a natural landscape composed of saltmarsh, levees, and various vegetation communities, generally surrounded by water, including McNulty Slough to the east, Hawk Slough to the southeast, and North Bay to the south. Coastal dunes are located along the western edge of the Project Area, abutting the Pacific Ocean. A barn and associated corrals adjacent to the northern boundary of the Project Area are located off of the gravel access road from Table Bluff Road.

The Project Area is visible from Table Bluff Road and Copenhagen Road, and from Table Bluff County Park. The views of the Project Area from Table Bluff Road and Copenhagen Road are generally limited to the foreground and some medium range views where the view point is elevated above the Project Area. Views of the dune restoration area from Table Bluff County Park are limited to the dunes immediately adjacent to the park, which obstruct longer range views of the Project Area and Pacific Ocean.

Visual Character of the Surrounding Area

The dominant visual character of the lands surrounding the Project Area is associated with pasture and agricultural lands interspersed with undeveloped saltmarsh and coastal dunes. Table Bluff County Park is located north of the Project Area and provides limited public amenities, including a paved parking area. Other land uses that contribute to the visual character of the surrounding area include rural residential homes to the north; single-family homes to the east and south; and the Pacific Ocean to the west. The closest residences in the Project vicinity are located northeast of the site along Indianola Reservation Road (near Area D), which was previously part of the Wiyot Tribe's Table Bluff Reservation. The two main roads bordering the Project Area are Table Bluff Road and Copenhagen Road, which primarily provide views of the adjacent homes, pasture and agricultural lands, vegetation, coastal views, and limited views of the Project Area.

Project Area Photographs

Images 3.1-1 through 3.1-8 show various viewpoints from within and adjacent to the Project Area. The photographs were taken on August 27, 2018. The location these images were taken from are indicated on Figure 3.1-1 – Photo Viewpoint Locations.



Image 3.1-1: Gravel access road off Table Bluff Road looking south at the Project Area.



Image 3.1-2: Existing barn and proposed parking lot area from the end of the access road looking west.



Image 3.1-3: Tidal wetlands in Area A looking northwest from the levee between Area A and Area B.



Image 3.1-4: Area B and distant buildings and hills in the background looking southeast.



Image 3.1-5: Area B and long-range view of surrounding land uses looking east.



Image 3.1-6: McNulty Slough from the perimeter levee around Area B, looking southeast.



Image 3.1-7: Long-range view of the Project Area from Table Bluff looking south.



Image 3.1-8: European beachgrass in the proposed dune restoration area, looking south.

Regulatory Framework

Federal

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

State

California Coastal Act

The California Coastal Act (Coastal Act) was enacted by the State Legislature in 1976 and is the primary law that governs the decisions of the California Coastal Commission. The Coastal Act outlines, among other things, standards for development within the Coastal Zone. The Project Area is located within the Coastal Zone.

Section 30251 (Scenic and Visual Qualities) under Article 6 (Development) of the 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

Eel River Area Plan

The *Eel River Area Plan* of the *Humboldt County Local Coastal Program* contains policies related to protecting existing visual resources. Views of the Project Area are available from areas adjacent to the Project Area, within the *Eel River Area Plan's* jurisdiction. The following policies related to scenic resources are applicable to the Project:

3.4.2 Visual Resource Protection Section 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.

New Development shall: Section 30253

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

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

Eel River Delta bottomlands

Scenic Protection

Designated Agriculture Exclusive which encourages continuation of current agricultural activities and prohibits conversion to non-resource dependent activities.

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 if located in an urbanized area, conflict with applicable zoning and other regulations governing scenic quality; 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

Construction, invasive plant management and maintenance activities associated with the Project would not result in impacts related to two of the significance criteria identified in Appendix G of the current CEQA Guidelines. Accordingly, the following significance criteria are not discussed further in the impact analysis:

- **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 designated State scenic highways in the Project Area or vicinity (Caltrans 2018), and the Project would not utilize a State scenic highway for access or otherwise impact a scenic resource associated with a State scenic highway. Therefore, the significance criterion related to substantially damaging scenic resources within a State scenic highway is not applicable to the 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 new lighting or reflective surfaces that would cause glare. No night-time construction work is proposed. Therefore, the Project would not create a new source of light and glare. No impact would occur.

Methodology

The visual impact analysis evaluates the effects the Project would have on the visual character and views of and from the study area. As described above, the aesthetics study area extends beyond the Project Area boundary and includes views of the Project Area from Table Bluff County Park and Table Bluff Road to the north, and views of the Project Area from Copenhagen Road to the east. The analysis is based on field observations, aerial photographs, and reviews of relevant planning documents. The potential for changes to views from visually sensitive public land uses is evaluated based on field observations. The visual impacts are qualitatively evaluated using the thresholds of significance discussed above.

Impacts and Mitigation Measures

Impact AES-1: Would the Project have a substantial adverse effect on a scenic vista?

A scenic vista can generally be defined as a view that has remarkable scenery or a broad or outstanding view of the natural landscape. The Humboldt County General Plan identifies scenic vistas from State Route 101, and from beaches, state parks, and coastal access points.

The Project Area is a generally undeveloped portion of land composed of saltmarsh, tidal wetlands, levees, and dunes that abut the Pacific Ocean. Distance views from Table Bluff are considered Coastal Zone Scenic Views and have the potential to be affected by the Project. The scenic viewpoint from Table Bluff offers long-range views of the Project Area, where the viewer can observe the various vegetated and

non-vegetated areas, saltmarsh and tidal wetland areas, and levees (Image 3.1-7). Additionally, the Table Bluff County Park has public beach access that abuts the northern edge of the dune restoration portion of the Project Area where European beachgrass management would occur. Views south of this public beach access have the potential to be affected by Project activities.

Estuarine restoration Project activities would be visible from the Table Bluff viewpoint. Views of equipment used to construct the estuarine restoration component of the Project would be visible for up to two construction seasons, and large areas of existing vegetation would be temporarily disturbed to remove and lower levees, excavate tidal channels, and install habitat features. It is anticipated the area restored to tidal inundation would recruit native saltmarsh vegetation to the site within one year, at which point the vegetated and aquatic characteristics of the estuarine restoration area would be comparable to existing conditions. Given the temporary nature of construction activities and the fact that the site would revegetate relatively quickly to comparable conditions, construction of the estuarine restoration portion of the Project would have a less-than-significant impact on scenic vistas.

Once the estuarine restoration portion of the Project is completed, the Project Area would include new recreational amenities including improved parking areas, creation of a formal trail system, and a new non-motorized boat put-in. These recreational components would not be readily visible from the identified scenic viewpoint from Table Bluff given their limited size and height. Accordingly, the addition of permanent recreational components to the Project Area would have a less-than-significant impact on scenic vistas.

Invasive plant management would focus on control and removal of dense-flowered cordgrass from tidal areas and European beachgrass from the dunes. By design, removal of these plant species would change the aesthetic of the Project Area from one dominated by a single species to one that supports a diversity of native plants. Removal of European beachgrass from the dunes would also, over time, change the shape of the foredune in the Project Area to one more typical of native coastal dune mat community (hummocky, semi-stable, and botanically diverse). It is anticipated that treatment areas may take 1-2 growing seasons to revegetate (and may be bare, charred, or otherwise disturbed in the interim). Although the proposed vegetation management activities would change the aesthetics of the area (both in the short- and long-term), they would not represent an adverse effect on a scenic vista. In fact, for many viewers, the restoration of the Project Area to one dominated by native species would enhance the visual quality of the area. Maintenance activities would be infrequent and temporary and would not impact scenic vistas. The Project would have a less-than-significant impact on scenic vistas.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact AES-2: In a non-urbanized area, would the Project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publically accessible vantage point).

The existing visual character of the Project Area is discussed in Section 3.1.1. The Project Area is located on the coast, within a rural setting, with various saltmarsh and tidal wetland areas, levees, and the open expanse of undeveloped landscape just east of the Pacific Ocean. As discussed under Impact AES-1 above, aesthetic impacts that may potentially occur during construction of the estuarine restoration portion of the Project would be temporary and only visible from limited locations (e.g., Table Bluff). Other views available from publicly traversed areas would be limited due to the topography of the surrounding environment and the proximity of the publicly accessible roadways to the Project Area. Once constructed, recreational amenities, including the improved parking, road, and trail facilities, would not substantially degrade the existing visual character or quality of the site as they would be limited in scope and generally low profile. Recreational use of the Project Area would be comparable to existing conditions (bird watching, hunting, and hiking), and would not substantially change views of or from the Project Area. Finally, the characteristics of the estuarine restoration area would be comparable to existing conditions after saltmarsh vegetation re-establishes, although fewer levees and built infrastructure would be present. Given the temporary nature of construction activities, the fact that the site would revegetate relatively quickly to comparable conditions, and the non-intrusive nature of the public access amenities, construction of the estuarine restoration portion of the Project would not substantially degrade the short-term visual character or quality of the site and its surroundings. Therefore, the Project would have a less-than-significant impact on the short-term visual quality of the site.

Construction equipment would also be used in the Project Area for invasive plant management. The invasive plant treatment that would be visible to the public would mainly occur within Areas A and D, which would be focused on dense-flowered cordgrass management. Invasive plant management within the dune restoration area would also occur and be focused on European beachgrass, although views of beachgrass treatment areas would be limited due to the existing dunes obstructing views from Table Bluff County Park. The treatment of the invasive plants would be intermittent, conducted on an annual or as needed basis, and as funding allows.

As described under Impact AES-1, by design, invasive plant management activities would change the aesthetic of both the tidal and dune restoration areas from a viewshed dominated by a single invasive species, to one dominated by a diversity of native plant species. Removal of European beachgrass from the dunes would also change the height and shape of the foredune in the Project Area to one more typical of a native coastal dune mat community (flatter, less densely vegetated). It is anticipated treatment areas may take 1-2 growing seasons to revegetate (and may be bare, charred, or otherwise disturbed in the interim). However, these temporary and long-term changes in the aesthetics of the Project Area would not substantially degrade the existing visual character or quality of the site and its surroundings. In fact, for many viewers, the restoration of the Project Area to one

dominated by native species would enhance the visual quality of the area. The Project would have a less-than-significant impact during the invasive plant management phase. Maintenance activities would have no effect on aesthetics.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Cumulative Impacts

Impact AES-C-1: Would the Project contribute to a cumulatively significant impact to visual resources?

As discussed in Section 3.1.3, the Project would not result in impacts relative to a state scenic highway or a new source of light or glare. Therefore, implementation of the Project would not contribute to cumulative impacts on these resources.

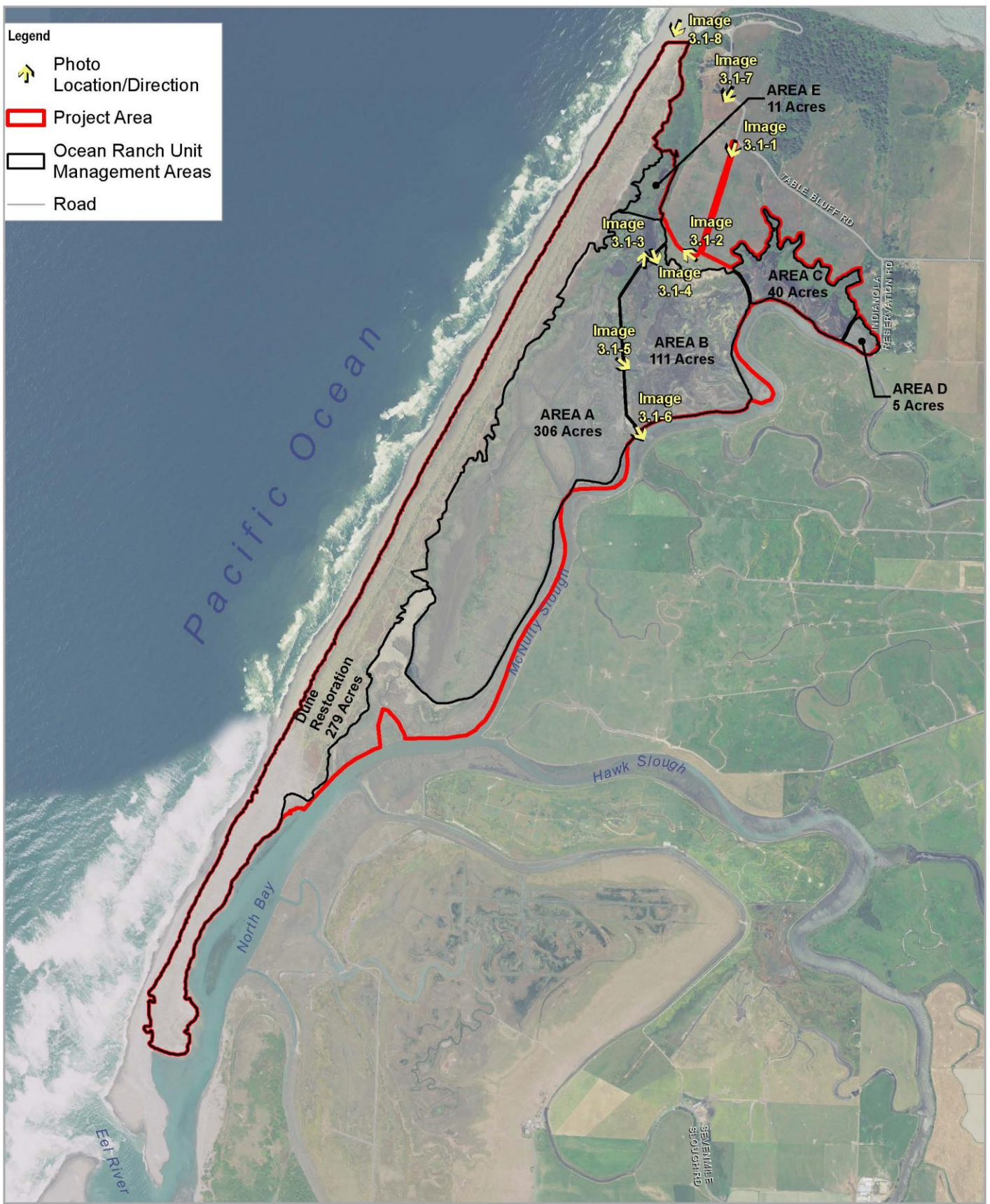
The Project would have less-than-significant impacts relative to scenic vistas (Impact AES-1), and degradation of visual character or quality (Impact AES-2). Similar to the Project, implementation of cumulative projects identified in Table 3.0-1 (Projects Considered for Cumulative Impacts), such as the Russ Property Levee Stabilization project and Cannibal Island Restoration Study Area, would result in other restoration focused projects in the area. Such projects typically result in comparable aesthetic qualities. Construction and maintenance of cumulative restoration projects may occur at the same time as the Project. However, cumulative impacts would be less than significant because construction and maintenance activities would be temporary and the distance between the Project Area and the identified cumulative projects would limit the potential for cumulative impacts in the study area.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

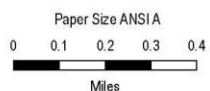
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http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/
- Humboldt County. 2017. Humboldt County General Plan. Available at:
<https://humboldt.gov.org/205/General-Plan>



Legend

- Photo Location/Direction
- Project Area
- Ocean Ranch Unit Management Areas
- Road



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



California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/16/2020

Photo Viewpoint Locations

FIGURE 3.1-1

3.2 Agricultural Resources

This section evaluates the potential impacts of the Project related to agricultural resources during construction, invasive plant management and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. There are no forestry resources within the Project Area and therefore, forestry resources are not considered in this analysis. For the purpose of this section, the study area is the same as the Project Area.

3.2.1 Setting

The following information discusses the agriculture-related context in which the proposed Project would be constructed and maintained.

Historical Context

The 850-acre (344 hectare) study area is located near the agriculturally rich community of Loleta, within the Eel River estuary in Humboldt County. The entire Eel River estuary including the study area was extensively altered over the last 150 years in order to expand agricultural production in the region. Historically, much of the area that is now the study area was estuarine saltmarsh. Comparisons of historic mapping to current conditions suggest that the non-dune portion of the study area and surrounding vicinity was wetlands, as it was termed “Swamp and Overflowed Land” in an 1890 State Lands Commission map. Nineteenth and early twentieth century reclamation efforts converted the non-dune portion of the study area and Project vicinity from saltmarsh to pastures through the construction of levees, tide gates, dikes and berms. Specifically, sometime between 1916 and 1948, the saltmarsh portion of the study area was diked, isolated from tidal waters, and drained for pasture through tide gates to McNulty Slough. The Project vicinity includes an assemblage of landscape features that reflect a strong tradition of ambitious land conversion and intensive agricultural management over the past 150 years.

The Bureau of Land Management's (BLM) General Land Office Records indicate that a portion of the study area (approximately 80 acres [32 hectare]) was patented to J. Clark in 1860 (Origer 2017). Clark built a barn and house on the parcels and is known for establishing the Ocean Ranch dairy farm. His descendant, Wm. S. Clark, would later inherit the 600 acre (243 hectare) dairy farm (Origer 2017). Following the acquisition of the Ocean Ranch property (a unit of the Eel River Wildlife Area) in 1986, CDFW created the *Table Bluff Ecological Reserve and Eel River Wildlife Area Operation and Maintenance Plans* (hereafter referred to as “*Operation and Maintenance Plans*”) to guide management of the Ocean Ranch

property (CDFW 1986). The document includes historical information about agricultural uses within the study area and a grazing management plan. According to CDFW's *Operations and Maintenance Plans* document:

Livestock grazing has been the primary use of the Ocean Ranch property for many years, probably since well before the turn of the century. At one time the area was operated as a dairy farm. In later years it has been used for beef livestock production. Beginning in 1961 the Russ family leased the ranch for this purpose and continued to run cattle there until 1986. According to Jack Russ the ranch supported about 250 animal units on an annual basis. Some hay cutting was done up until about 10 years ago (approximately 1976) when it was discontinued... Under the terms of the sale of the Ocean Ranch to the Wildlife Conservation Board, the sellers retained the grazing rights for a period of five years.

A Grazing Management Plan was created as a subset of the *Operation and Maintenance Plans* to account for the seller's grazing rights throughout the five year period following sale of the property. The methodology used in creating the grazing plan was provided by the University of California Agricultural Extension Service, (now known as the University of California Cooperative Extension), in partnership with Humboldt County. The total acreage of suitable grazing land open to grazing was 745 acres (301 hectares), of which approximately 500 acres (202 hectares) is within the study area. The adopted grazing plan was carried out for a period of five years, from 1986 to 1991 (CDFW 1986).

Existing Land Uses

Existing land uses within the study area consist of freshwater wetlands, tidal saltmarsh, a network of dilapidated levees, and sand dunes (See Section 3.5 for a more detailed description of existing conditions within each management unit). An unpaved road is present within the study area, and an old barn and associated corrals are located immediately adjacent to the study area. CDFW acquired the study area in 1986 with the intention of managing the site for wildlife and wildlife-oriented recreational uses (CDFW 1986). There are no records of continued grazing beyond the five year period which started in 1986, and it is believed that grazing ceased in the study area around 1991. Moreover and as discussed below, the farmland that once existed in the study area is no longer viable due to levee breaches and tidal inundation that have made the land too wet and saline to agricultural production.

Cattle grazing for vegetation management takes place on lands adjacent to the northern boundary of the study area under five-year agreements. The Project would have no effect on the cattle grazing to the north.

Physical Context

Soil Mapping

A Soil Summary Map denoting Natural Resources Conservation Service (NRCS) mapped soil types in the study area is provided as Figure 3.2-1. The soils found in the study area, including their NRCS identification number and Land Capability Classification (LCC) information, are discussed below. An LCC shows, in a general

way, the suitability of soils for most kinds of field crops (NRCS 2019a). Soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management (NRCS 2019a). Capability classes are designated by numbers one (I) through eight (VIII). The numbers indicate progressively greater limitations and narrower choices for practical use. According to Helms (1992):

The first four classes are arable land, suitable for cropland, in which the limitations on their use and necessity of conservation measures and careful management increase from one through four (I thru IV). The remaining four classes, five through eight (V thru VIII), are not to be used for cropland, but may have uses for pasture, range, woodland, grazing wildlife, recreation and aesthetic purposes. Within the broad classes are subclasses which signify special limitations such as (e) erosion, (w) excess wetness, (s) problems in the rooting zone, and (c) climatic limitations.

All soils information discussed below is sourced from NRCS' Web Soil Survey (2019b). As described below, mapped soils in the study area are generally not agriculturally productive soils. Many of the soil series do not drain water effectively, are consistently tidally influenced, and are in brackish conditions with moderate salinity.

Water and Fluvents (100)

This soil type is representative of point bars on waterway channels and is located along the banks of McNulty Slough within the study area. Its parent material is alluvium derived from mixed sources. The soil profile typically contains gravelly fine sandy loam in the top horizon for approximately 0-13 inches, followed by extremely gravelly sandy loam in the profile beneath it from 13 to 59 inches. Its LCC is Vw if irrigated or nonirrigated, and it is considered a hydric soil.

Weott (110)

This soil series is typically found in freshwater wetlands or marshes, depressions, and floodplain steps. It is located in a narrow band within Area A of the study area. Its parent material is alluvium derived from mixed sources. Silt loam is found in all of the horizons of a typical soil profile for this soil series. Its LCC is Vw if irrigated or nonirrigated indicating there are multiple use restrictions to this type of soil involving water. It is considered a hydric soil and ponds water frequently. It has a range of salinity including nonsaline to very slightly saline.

Occidental (140)

The soil associated with this series is typically found in saltmarsh habitat, and is located in the eastern portion of the study area in patches adjacent to the banks of McNulty Slough and tidally inundated portions of Area C. Its parent material is alluvium derived from mixed sources. Its typical soil profile consists of peat in the upper horizon (up to 3 inches depth) followed by silt clay loam spanning the remaining depth (3-63 inches) over three horizons. Its LCC is VIIw indicating the soil is poor quality for production and that water is a limiting factor. It is considered a hydric soil and ponds water frequently. Soils in this series are typically slightly saline to strongly saline. The soil is considered hydric.

Wigi complex (141)

This soil type, which is typically found in saltmarsh habitat, is located in the interior portion of the study area, adjacent to the dune restoration area. Its parent material is alluvium derived from mixed sources. Its typical soil profile consists of peat in the upper horizon (up to one inch deep), followed by silt loam down to seven inches deep, followed by silty clay loam spanning three horizons to 60 inches. Its LCC is VII indicating it is of poor quality for production and that shallowness and/or salinity is a limiting factor. The soil complex is considered hydric, and is strongly saline.

Samoa-Clambeach complex (155)

This soil type is a mixture of the Samoa soil series and Clambeach soil series and is typically found in sand dunes. It is located within the proposed dune restoration area and in patches within Area A within the study area. Its parent material is aeolian and marine sand derived from mixed sources. The typical soil profile consists of slightly decomposed plant material in the upper horizon (up to one inch), followed by sand spanning three horizons to a depth of 63 inches. Its LCC is VIe indicating it is a poor quality for cultivation and that erosion is a limiting factor. The soil complex is not considered hydric, has low available water storage, and is nonsaline to very slightly saline.

Oxyaquic Udipsamments-Samoa complex (157)

This soil type is a mixture of Oxyaquic Udipsamments soil series and Samoa soil series and is typically found at the toeslope of beaches. It is located at the southern tip of the study area, close to the mouth of the Eel River, and along the beach at the northern end of the dune restoration area. Its parent material is beach sand and gravel derived from mixed sources. The typical soil profile consists of fine sand or sand spanning over two horizons to a depth of 60 inches. Its LCC is VIII, indicating it is highly unsuitable for cultivation. It is not considered a hydric soil complex and is strongly saline (Oxyaquic Udipsamments) or nonsaline to very slightly saline (Samoa).

Hookton-Tablebluff complex (230)

This soil type is a mixture of Hookton and Tablebluff soil series and is typically found in the form of erosion remnants on the summit of a landform. It is located in the northern portion of the study area at the terminus of the access road. Its parent material is either mixed alluvium or aeolian deposits over mixed alluvium. This soil series complex is IIe indicating it is suitable for cultivation, although there are erosion-related limiting factors. It is not considered a hydric soil, does not pond water frequently, and ranges from being considered nonsaline to very slightly saline.

Cannonball-Candymountain-Lepoil complex (233)

This soil type is a mixture of Cannonball, Candymountain and Lepoil soil series and is typically found in the form of erosion remnants, marine terraces or hills on marine terraces on either the summit or backslope of a landform. A small amount of this soil type can be found at the northern extent of the dune restoration area. Its parent material consists of mixed alluvium, mixed marine deposits or sedimentary rock. The soil series complex LCC is VIe indicating it is not suitable for cultivation and that erosion is a limiting factor. The soil series complex is not considered hydric, does

not pond water frequently, and ranges from being considered nonsaline to very slightly saline.

3.2.2 Regulatory Framework

The following federal, state and local policies provide for protection of Prime, Unique or Farmland of Statewide Importance.

Federal

Federal Farmland Protection Policies

Under the Federal Farmland Protection Policy Act (FPPA), projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by, or with the assistance of, a federal agency. The NRCS is charged with oversight of the FPPA. The proposed Project is funded with federal funds, and occurs on historic pastureland, warranting consideration under the FPPA.

NRCS uses a Land Evaluation and Site Assessment (LESA) system to establish a farmland conversion impact rating score on proposed sites of federally funded and assisted projects. The assessment is conducted on the Farmland Conversion Impact Rating form. According to this form, if the site does not contain Prime, Unique, Statewide or Local Important Farmland, then the FPPA does not apply. In California, maps of these different farmland types are prepared by the Department of Conservation through the Farmland Mitigation and Monitoring Program (FMMP). The study area has not been mapped through FMMP, and therefore does not contain the designations mentioned above. Therefore, the requirements of the FPPA would not apply to this Project. Consideration of any potential future classification of agricultural lands in the study area in the absence of FMMP mapping is discussed under CEQA below.

State

Farmland Conservancy Program Act

State farmland protection policy is described in the California Farmland Conservancy Program Act (CFCPA) (Public Resources Code (PRC) Section 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 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 CFCPA is not relevant to the Project because there is an absence of viable farmland within the study area.

California Environmental Quality Act (CEQA)

Pursuant to CEQA, agricultural land may be mapped through the FMMP and designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The Department of Conservation identifies and maps these areas, as defined below, based on water availability, soil temperature range, acid-alkali

balance, water table location, soil sodium content, flooding, erodability, permeability, rock fragment content, and rooting depth.

Prime Farmland: Farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Prime Farmland must have been used for the production of irrigated crops at some time during the two update cycles (or four years) prior to the mapping date.

Unique Farmland: Farmland with the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to current farming methods. This land is usually irrigated, but may include non-irrigated orchards or vineyards as found in some climatic zones in California. For land to be classified Unique Farmland, the crop grown on the land must have qualified for the “California Agriculture” list at some time during the two update cycles (or four years) prior to the mapping date.

Farmland of Statewide Importance: Farmland other than Prime Farmland which has a good combination of physical and chemical characteristics for the production of crops but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Farmland of Statewide Importance must have been used for the production of irrigated crops at some time during the two update cycles (or four years) prior to the mapping date.

CEQA requires lead agencies to potential impacts to agricultural resources at least in part based on the FMMP. However, in areas where lands have not been mapped through the FMMP (such as the study area), PRC Section 21060.1(b) states a property is considered “prime agricultural land” if it meets any of the following definitions provided at Government Code (GOV) Section 51201(c):

(c) “Prime agricultural land” means any of the following:

1. *All land that qualifies for rating as class I or class II in the NRCS land use capability classifications.*
2. *Land which qualifies for rating 80 through 100 in the Storie Index Rating.*
3. *Land which 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 as defined by the United States Department of Agriculture.*
4. *Land planted with fruit- or nut-bearing trees, vines, bushes, or crops which have a nonbearing 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 two hundred dollars (\$200) per acre.*

A determination of which lands can be considered “prime agricultural land” per PRC Section 21060.1(b) is discussed in Impact AG-1 of Section 3.2.5.

Under CEQA, an impact on an agricultural resource is considered significant if a Project would result in an impact to or conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. A LESA evaluation is an optional model to assess impacts on agricultural resources. CDFW determined that a LESA evaluation was not appropriate for this Project, as no viable farmland exists within the study area due to the daily tidal inundation, residual soil salinity, and abundant wetlands and sand dunes occurring onsite. Lands within the study area have not been utilized for agricultural production for nearly 30 years.

California Coastal Act

The study area is within the Coastal Zone. The California Coastal Act (Coastal Act) contains the Government Code policies relevant to the conversion of agricultural land in the Coastal Zone to natural resource uses. The lands within the study area were used for agricultural production almost 30 years ago, and according to Government Code Section 51201 (c), one soil series (Hookton-Tablebluff complex) can be considered a “prime agricultural land.” The following Coastal Act sections are germane to this impact analysis:

Public Resources Code Section 30113

“Prime agricultural land” means those lands defined in paragraph (1), (2), (3), or (4) of subdivision (c) of Section 51201 of the Government Code.

Public Resources Code Section 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 Section 30242

All other lands suitable for agricultural use shall not be converted to nonagricultural uses unless (1) 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

Lands within the study area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential impacts related to agricultural resources would be limited to the study area, local and regional regulatory policies are not considered in this analysis.

3.2.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the current 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 prepared pursuant to the FMMP of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or

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

3.2.4 Methodology

The study area used to analyze potential impacts to agricultural resources contains coastal dunes, tidal lands and submerged lands. A significant impact would occur if implementation of the proposed Project would result in inconsistencies or conflicts on these lands with the adopted goals and policies of applicable rules and regulations of the Coastal Act or CFCPA. The impact analysis included in this section is based on various studies and agricultural resources investigations and analyses conducted for the Project by GHD Inc., Ducks Unlimited, Inc., CDFW and NRCS.

Areas of No Project Impact

Construction, invasive plant management and maintenance of the Project would not result in impacts related to four of the significance criteria identified in Appendix G of the current CEQA Guidelines. As the Project will not impact the following significance criteria, these four criteria are not further discussed in the impact analysis:

- **Would the Project conflict with existing zoning for agricultural use, or a Williamson Act contract?** As stated above, the study area is state owned and local county zoning laws do not apply to the Project. None-the-less, land in the study area is zoned Agriculture Exclusive (AE) with 60 acre (24 hectare) minimum lots, with Coastal Wetlands (W), Flood Hazard Areas (F), Streams and Riparian Corridor Protection (R), and Transitional Agricultural Lands (T) combining zones. Conditional uses of AE zoned lands include Fish and Wildlife Management, Watershed Management, Wetland Restoration, Resource-Related Recreation and Coastal Access Facilities, which are consistent with the Project. There are no Williamson Act contracts on lands within the study area (DOC 2015). Therefore, the Project would not conflict with zoning or a Williamson Act contract, and no impact would result.
- **Would the Project conflict with existing zoning for, or cause rezoning of, forest land (as defined in PRC Section 12220(g)), timberland (as defined by PRC Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?** There are no forest lands, timberland or timberland zoned Timberland Production in the study area; therefore, no forest land or timberland would be converted to non-forest or non-timberland use. The nearest area designated as a Timber Production Zone is located approximately five miles east of the study area and is held under private ownership. The Project would not impact the zoning of this area, and no impact would occur.
- **Would the Project result in the loss of forest land or conversion of forest land to non-forest use?** There are no forest lands within the study area; therefore, no forest land would be converted to non-forest use. No impact would result.

- **Would the Project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?** There are no other changes in the existing environment related to the Project that would impact Farmland or forest land in or adjacent to the study area. No impact would result.

3.2.5 Impacts and Mitigation Measures

Impact AG-1: Would the Project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps for the Farmland Mapping and Monitoring Program (FMMP) by the California Resources Agency, to non-agricultural use?

Lands within the Project Area have not been formally analyzed by the Department of Conservation to determine if they meet the criteria for being designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. In accordance with PRC Section 21060.1(b), areas that have not been surveyed and classified through the FMMP can be considered “prime agricultural land” if they meet one of the four definitions provided at GOV Section 51201(c):

1. All land that qualifies for rating as class I or class II in the NRCS land use capability classifications.
2. Land which qualifies for rating 80 through 100 in the Storie Index Rating.
3. Land which 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 as defined by the United States Department of Agriculture.
4. Land planted with fruit- or nut-bearing trees, vines, bushes, or crops which have a nonbearing 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 two hundred dollars (\$200) per acre.

As described in Section 3.2.1, eight different soil types have been mapped by NRCS within the study area, all of which are generally not agriculturally productive soils. Many of the soil series do not drain water effectively, are consistently tidally influenced, and are in brackish conditions with moderate salinities. Only one of the eight soil series (Hookton-Tablebluff complex) has a LCC rating of class II consistent with the definition of “prime agricultural land” provided at GOV 50201(c)(1) (as well as at Section 30113 of the Coastal Act). None of the soils meet the Storie Index rating criteria provided at GOV 50201(c)(2), and lands in the study area have been used for crop or livestock production for over 30 years (as defined at GOV 50201(c)(3)-(4)).

The Hookton-Tablebluff complex is located along the northeastern portion of the study area, near Table Bluff, and constitutes approximately eight percent of the soil within the study area (NRCS 2019b). The area associated with this soil type includes some mapped aquatic habitats (Pacific Coast Fish, Wildlife and Wetlands

Restoration Association 2018), the road that provides access to the study area, and higher elevation areas that transition north towards Table Bluff. As noted above, none of this area has been used for agricultural production for over 30 years. As a result, implementation of the Project would not result in the conversion of agriculturally viable land to a non-agricultural use.

In summary, only a small portion (eight percent) of the study area has a mapped soil that meets the definition of “prime agricultural land” provided at PRC Section 21060.1(b) and/or Section 30113 of the Coastal Act. The study area has not been used for agricultural purposes for nearly 30 years, is tidally influenced, and is too saline and wet to support agriculture. The Project would not convert designated Prime Farmland, Unique Farmland or Farmland of Statewide Importance to a non-agricultural use because those designations do not exist within the study area, and because the Project inherently wouldn’t impact viable farmland. The Project would not conflict with policies related to agricultural lands under the FMMP, because FMMP classifications within the study area do not exist, and renewed agricultural use is not feasible within the study area, respectively. Therefore, the impact on agricultural land would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.2.6 Cumulative Impacts

Impact AR-C-1: Would the Project contribute to a cumulatively significant impact to Agricultural Resources or Forestry Resources?

As discussed in Impact AG-1, the Project would result in a less-than-significant impact on agricultural land. As the land uses in the vicinity of the study area have a history of being used for agricultural purposes, the potential exists for the construction and maintenance of other restoration based cumulative projects identified in Table 3-1 to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use. However, as the Project itself would not convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to a non-agricultural use, the Project’s contribution to cumulative impacts related to the potential conversion of agricultural lands to a non-agricultural use would not be cumulatively considerable, and therefore less than significant.

Mitigation Measures: No mitigation is necessary.

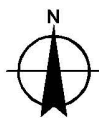
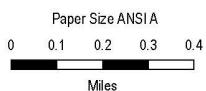
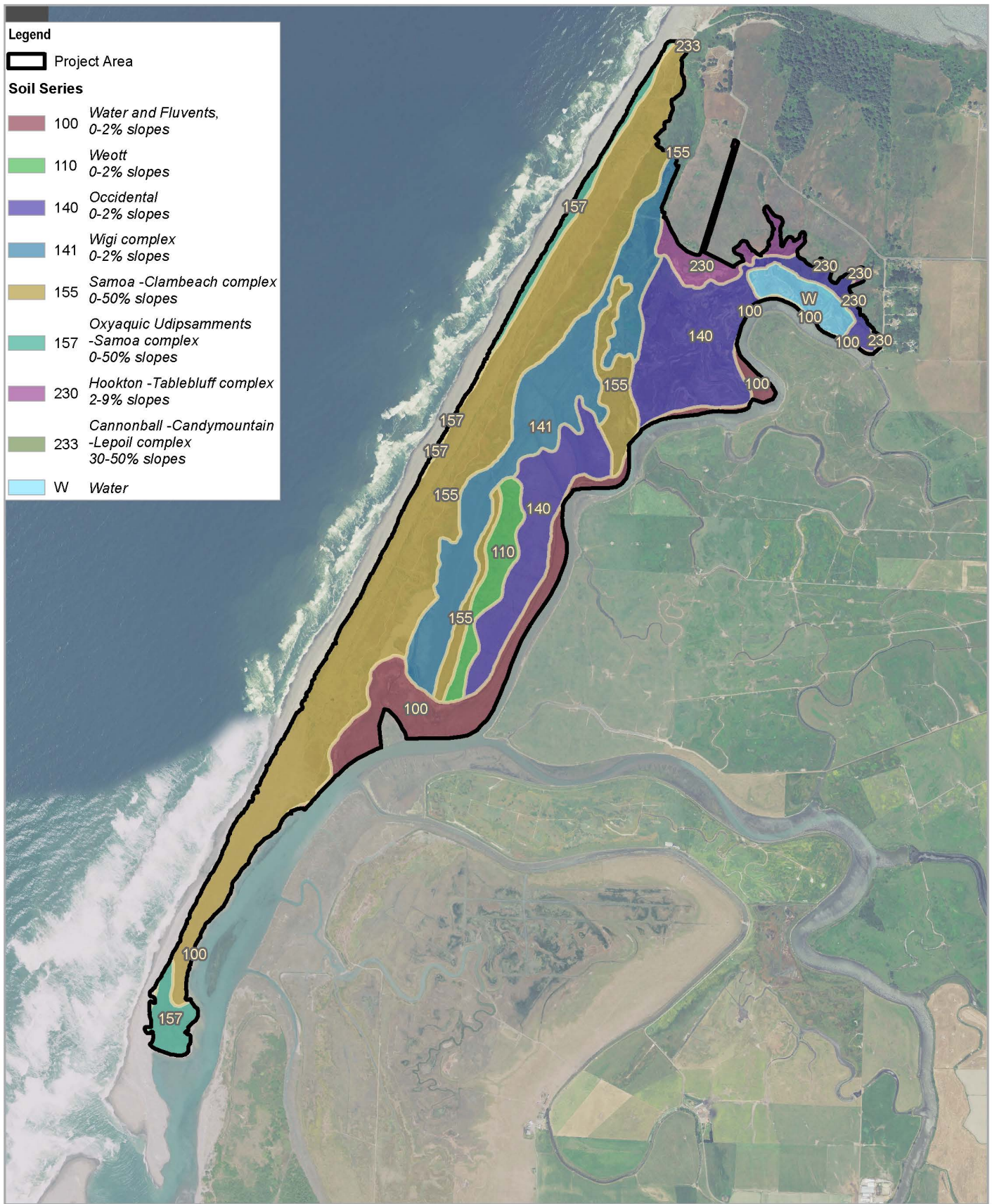
Level of Significance: Less than Significant.

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California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 06/16/2020

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

NRCS Soil Map Units

FIGURE 3.2-1

3.3 Air Quality

This section evaluates potential impacts related to air quality during construction, invasive plant management and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. For the purposes of this analysis, invasive plant management activities are anticipated to occur for up to ten years or as long as needed to achieve control and/or eradication. Potential impacts from public access related to air quality are also considered in this section. The study area for this section includes the Project Area and adjacent lands where sensitive receptors may be impacted by air emissions caused by the Project.

3.3.1 Setting

North Coast Air Basin

The Project Area 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. The Project Area is located within the North Coast Unified Air Quality Management District (NCUAQMD).

Climate

The local climates, or sub-climates, within the North Coast Air Basin are affected by elevation and proximity to the Pacific Ocean. Humboldt County contains sub-climates that are created by local topography and proximity to the ocean. The study area is located proximal to the Pacific Ocean and is influenced by coastal fog throughout the year. Precipitation within the County is seasonal, with 90 percent of the annual precipitation occurring between October and April. During the winter, moderate temperatures, frequent fog, and moderate to heavy precipitation cause inversions, which impact air quality. Inversions are created when warm air traps cool air near the ground surface and hinders vertical dispersion. Humboldt County commonly experiences two types of inversions, vertical and horizontal, that affect the vertical depth of the atmosphere through which pollutants can be mixed. Vertical air movement is important in spreading pollutants through a thicker layer of air. Horizontal movement is important in spreading pollutants over a wider area. Upward dispersion of pollutants is hindered wherever the atmosphere is stable; that is, where warm air overlies cooler air below (Humboldt County 2017).

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 most likely to be affected by air pollution: children, the elderly,

the acutely ill, and the chronically ill, especially those with cardio-respiratory diseases. Sensitive receptors include residences, schools, playgrounds, childcare centers, retirement homes, hospitals, and medical clinics. Agricultural areas are less sensitive to poor air quality because population density is low.

The Project Area is located in an undeveloped agricultural area. The closest residences to the Project Area are located approximately 350 feet (107 meters) east along Indianola Reservation Road. Other rural residences are located approximately 3,600 feet (1,097 meters) east of McNulty Slough, on the east side of the Project Area.

Existing Air Quality – Criteria Air Pollutants

The CARB and the U.S. Environmental Protection Agency (EPA) currently focus on the following criteria air pollutants as indicators of ambient air quality: ozone, carbon monoxide (CO); nitrogen dioxide, sulfur dioxide; lead, and particulate matter (PM). Table 3.3-1 summarizes state and federal ambient air quality standards. The region is in attainment for lead, sulfur dioxide, and nitrogen dioxide; therefore, those pollutants are not further discussed. The following section discusses the remaining criteria pollutants - PM, ozone, and CO - for which PM and ozone are of greatest concern in the region (NCUAQMD 2019).

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

Pollutant	Averaging Time	California Standards		National Standards	
		Standard	Humboldt County Status	Standard	Humboldt County Status
Ozone	8-hour	0.070 ppm (137 µg/m ³)	Attainment	0.075 ppm (147 µg/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)	

Pollutant	Averaging Time	California Standards		National Standards	
		Standard	Humboldt County Status	Standard	Humboldt County Status
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	Attainment	None	
Fine Particulate Matter (PM _{2.5})	24-hour	None	NA	35 µg/m ³	Unclassified/Attainment
	Annual	12 µg/m ³	Attainment	12 µg/m ³	

Sources: CARB 2016. CARB 2018. NCUAQMD 2019.

Notes:

ppm = parts per million

mg/m³ = milligrams per cubic meter

µg/m³ = micrograms per cubic meter

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 PM₁₀. 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 study area 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 2017).

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 (NO_x), 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, 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 2017). 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, typically during the summer.

Carbon Monoxide

Carbon monoxide is a non-reactive pollutant that is toxic, invisible, and odorless. It is formed by the incomplete combustion of fuels. The largest sources of CO emissions are motor vehicles, wood stoves, and fireplaces. Carbon monoxide is directly emitted to the atmosphere, where levels are strongly influenced by meteorological factors such as wind speed and atmospheric stability. The health threat from elevated ambient levels of CO is most serious for those who suffer from heart disease, like angina, clogged arteries, or congestive heart failure; however, high levels of CO can affect even healthy people. People who breathe high levels of CO can develop vision problems, reduced ability to work or learn, reduced manual dexterity, and difficulty performing complex tasks. At extremely high levels, CO is poisonous and can cause death.

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 in Table 3.3-1. Toxic Air Contaminants are found in ambient air, especially in urban areas, and are caused by industry, agriculture, fuel combustion, and commercial operations (e.g., dry cleaners). Toxic Air Contaminants are typically found in low concentrations, even near their source (e.g., diesel particulate matter near a freeway).

According to the CARB, diesel exhaust is a complex mixture of gases, vapors, and fine particles. 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 (see Section 3.3.2 below).

3.3.2 Regulatory Framework

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.

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. Specifically, 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.

Federal

The EPA is responsible for enforcing the federal CAA and for establishing the National Ambient Air Quality Standards (NAAQS). The NAAQS are required under the CAA and subsequent amendments.

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 endeavour 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. CARB 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 NCUAQMD, one of 35 air districts in California, has jurisdiction over Humboldt, Del Norte, and Trinity counties. The NCUAQMD's primary responsibility is for controlling air pollution from stationary sources and maintaining healthful air quality throughout the tri-county jurisdiction. The NCUAQMD 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 NCUAQMD monitors air quality; enforces local, state and federal air quality regulations for counties within its jurisdiction; inventories and assesses the health risks of TACs; and adopts rules that limit pollution.

Humboldt County is listed as "attainment" or "unclassified" for all the federal and state ambient air quality standards except for the state 24-hour particulate (PM₁₀) standard (Table 3.3-1). The NCUAQMD has not formally adopted significance thresholds that would apply to the proposed Project. For construction emissions, the NCUAQMD has indicated that emissions are not considered regionally significant for projects whose construction would be of relatively short duration (i.e., lasting less than one year). For project construction that lasts more than one year or that involves above average construction intensity in volume of equipment or area disturbed, construction emissions may be compared to stationary source thresholds (NCUAQMD 2015).

Construction activities are subject to Rule 104 (Prohibitions) Section D (Fugitive Dust Emission), which requires reasonable precautions be taken to prevent PM from becoming airborne. These precautions include but are not limited to: 1) covering open bodied trucks when used for transporting materials likely to give rise to airborne dust; and 2) the use of water during the grading of roads or the clearing of land.

Prescribed burning activities are also subject to Regulation II – Open Burning and require a Non-Standard Burn Permit. Depending on the type of burn project, the NCUAQMD may also require a Smoke Management Plan. Burn day status (i.e., days when prescribed burning is allowed) are determined by the CARB on a daily basis. Inversion layer and wind direction are included among the factors used in determining burn day status.

Finally, 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. This Project does not include any new stationary sources; therefore, Rule 110 would not apply.

Humboldt County General Plan

Portions of the study area (i.e., areas outside of the Project Area that are not owned by CDFW) are subject to local oversight and compliance with the Humboldt County General Plan and Eel River Area Local Coastal Plan. The goals and policies within the Humboldt County General Plan that regulate air quality include the following:

AQ-1. Improved Air Quality

Air quality that meets state and federal ambient air quality standards.

AQ-2. Particulate Emissions

Successful attainment of CAAQS for PM.

AQ-G3. Other Criteria Pollutants

Maintain attainment of CAAQS for ozone and other criteria pollutants which may be subject to tightening standards.

AQ-P2. Reduce Localized Concentrated Air Pollution

Reduce or minimize the creation of hot spots or localized places of concentrated automobile emissions.

AQ-P4. Construction and Grading Dust Control

Dust control practices on construction and grading sites shall achieve compliance with NCUAQMD fugitive dust emission standards.

AQ-P7. Interagency Coordination

Coordinate with the NCUAQMD early in the permit review process to identify expected regulatory outcomes and minimize delays for projects involving:

- A. CEQA environmental review;
- B. Building demolition projects that may involve removal of asbestos-containing material subject to National Emission Standards for Hazardous Air Pollutants; and

- C. Grading and mining operations subject to State Airborne Toxic Control Measures for naturally occurring asbestos. Rely on the air quality standards, permitting processes, and enforcement capacity of the NCUAQMD to define thresholds of significance and set adequate mitigations under CEQA to the maximum extent allowable.

Eel River Area Local Coastal Plan

No air quality regulations are listed or discussed in the Eel River Area Local Coastal Plan.

3.3.3 Evaluation Criteria and Significance Thresholds

The evaluation criteria and significance thresholds summarized below are used to determine if the Project would have a significant effect related to air quality. 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;
- 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;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors) adversely 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:

- NO_x – 40 tons per year
- ROG – 40 tons per year
- PM₁₀ – 15 tons per year
- CO – 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.

Impacts related to construction dust are considered significant if dust is allowed to leave the site (NCUAQMD 2015).

3.3.4 Methodology

California Emissions Estimator Model (CalEEMod, Version 2016.3.2) was used to estimate air pollutant emissions from Project construction, invasive plant

management and maintenance activities and public access. The construction emissions modelling was based on the construction equipment inventories, schedule, and estimated hauling quantities developed for the Project. Construction-related fugitive dust emissions are discussed qualitatively.

Criteria pollutant emissions from the proposed prescribed burning of 279 acres of European beachgrass and 571 acres of dense-flowered cordgrass were estimated using the EPA's AP42 emission factors (13.1 Wildfires & Prescribed Burning) and estimated fuel loading from the Pacific Northwest U.S. Department of Agriculture's (USDA) Digital Photo Series for California Grasslands (USDA 2019). The annual rate of prescribed burning is currently unknown; prescribed burning could occur up to 10 years or more. For the purposes of a conservative analysis, the emissions quantification assumes that all prescribed burning could occur within one year.

Post-construction Project emissions were also estimated using CalEEMod to evaluate emissions from invasive plant management activities, site maintenance, and use of the Project Area by the public, at an assumed rate of 6 trips per day. These emissions were modelled for year 2022. It was assumed that ongoing invasive plant management activities include the use of one (1) excavator and two (2) tractors/loaders/backhoes.

3.3.5 Impacts and Mitigation Measures

Impact AQ-1: Would the Project conflict with or obstruct implementation of the applicable air quality plan?

Construction

This impact relates to consistency with an adopted attainment plan. Within the study area, the NCUAQMD is responsible for monitoring and enforcing local, state, and federal air quality standards. As summarized in Table 3.3-1, Humboldt County is designated 'attainment' for all NAAQS. With regard to the CAAQS, Humboldt County is designated attainment for all pollutants except PM₁₀ (where it is designated as "non-attainment")(Table 3.3-1). Therefore, any use or activity that generates airborne PM, including construction-related dust, may be of concern to the NCUAQMD. As noted above, Rule 104, Section D – Fugitive Dust Emissions is used by the NCUAQMD to address non-attainment for PM₁₀. Pursuant to Rule 104 Section D, reasonable precautions must be taken when handling, transporting or storing materials to prevent PM from becoming airborne.

Vehicle trips to and from the Project Area and earth moving activities that would occur during Project construction would generate fugitive dust (PM₁₀). The amount of dust generated at any given time would be highly variable and dependent on the size of the area disturbed, amount of activity, soil conditions, meteorological conditions, and number of vehicle trips. Fugitive dust emissions during construction of the Project could be a significant impact; Mitigation Measure AQ-1 would be implemented to reduce this potential impact to a level that would be less than significant.

Invasive Plant Management

Invasive plant management may include hand removal or mechanical excavation of dense-flowered cordgrass and hand removal or smothering of dwarf eelgrass, both of which are located in wet environments where exposed earth is not likely to become airborne. Excavations of European beachgrass with heavy equipment is a potential method for its removal. Invasive plant management may include prescribed burning as a method to reduce European beachgrass and/or dense-flowered cordgrass biomass, which would cause a temporary increase in the amount of airborne PM during the period the fire is burning. Prescribed burns are anticipated to be utilized intermittently as a means of long-term land management and would occur infrequently (e.g., a few times a year at most). Due to the limited handling, transport or open storage of materials, and prescribed burns in which PM may become airborne, invasive plant management is not expected to conflict with NCUAQMD's Rule 104 Section D. A less than significant impact on air quality from invasive plant management would occur.

Maintenance

Maintenance of the Project would typically not include the handling, transporting or open storage of materials in which PM may become airborne. However, although expected to be infrequent, maintenance may require additional gravel, soil or similar material to be brought on site, should the need for such materials arise. Maintenance would also involve driving on the proposed road and potentially off-road, which has the potential to result in PM becoming airborne. However, maintenance activities would be limited in duration and infrequent. Due to the limited driving, handling, transport or open storage of materials in which PM may become airborne, maintenance of the Project is not expected to conflict with NCUAQMD's Rule 104 Section D. A less than significant impact on air quality from maintenance of the Project would occur.

Mitigation Measures: Implement Mitigation Measure AQ-1.

Mitigation Measure AQ-1: Dust Control Measures During Construction

The contractor shall implement the following measures during construction:

- All exposed surfaces (e.g., parking areas, staging areas, soil piles, active graded areas, excavations, and unpaved access roads) shall be watered two times per day in areas of active construction.
- All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph), unless the unpaved road surface has been treated for dust suppression with water, rock, wood chip mulch, or other dust prevention measures.
- All surfaces to be paved shall be paved as soon as possible.
- Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to five minutes. Clear

signage regarding the same shall be provided for construction workers at all access points.

- All construction equipment shall be maintained and properly tuned in accordance with the manufacturer's specifications.
- A publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints shall be posted. This person shall respond and take corrective action within 48 hours. The NCUAQMD's phone number shall also be visible to ensure compliance with applicable regulations.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-1 complies with the best management practices recommended by the NCUAQMD 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: **Would the Project 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?**

Localized PM₁₀

The County is designated attainment for all state and federal standards, with the exception of the state's PM₁₀ standard. Localized PM₁₀ is of concern during construction because of the potential to emit fugitive dust during earth-disturbing activities.

The Project includes clearing and grubbing, excavation, grading, vegetation removal, embankment work, and construction of public access facilities. Generally, the most substantial air pollutant emissions would be dust generated from site clearing and grubbing, grading, and excavation. These emissions could lead to both health and nuisance impacts. Construction activities would also temporarily generate emissions of equipment exhaust and other air contaminants. The Project's potential impacts from equipment exhaust are assessed separately in question (c) below.

The NCUAQMD does not have formally adopted thresholds of significance for fugitive, dust-related PM emissions above and beyond Rule 104, Section D which does not provide quantitative standards. For the purposes of analysis, this document uses the Bay Area Air Quality Management District (BAAQMD) approach to determining significance for fugitive dust emissions from Project construction. The BAAQMD bases the determination of significance for fugitive dust on a consideration of the control measures to be implemented. If all appropriate emissions control measures recommended by BAAQMD are implemented for a project, then fugitive dust emissions during construction are not considered significant. BAAQMD recommends a specific set of Basic Construction Measures to reduce emissions of construction-generated PM₁₀ to less than significant. Without

incorporation of these Basic Construction Measures, the Project's construction-generated fugitive PM₁₀ (dust) would result in a potentially significant impact.

The Basic Construction Measure controls recommended by the BAAQMD are incorporated into Mitigation Measure AQ-1. These controls are consistent with NCUAQMD Rule 104 Section D for Fugitive Dust Emission and provide supplemental control of fugitive dust emissions beyond that which would occur with Rule 104 Section D compliance alone. Therefore, with implementation of Mitigation Measure AQ-1 the Project would result in a less than significant impact for construction-related PM₁₀ generation and would not violate or substantially contribute to an existing or projected air quality violation.

Construction

The NCUAQMD does not consider emissions regionally significant for projects whose construction would be of relatively short duration, lasting less than one year. Emission modelling was conducted based on a two-year construction window, or 131 days of Project work per year.

The NCUAQMD does not have established CEQA significance criteria to determine the significance of impacts that may result from a 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. 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.

CalEEMod version 2016.3.2 was used to estimate air pollutant emissions from Project construction equipment and earthmoving. Construction of the Project is expected to require two years to complete.

Detailed construction equipment activity was estimated based on Project construction components and detailed data from the Project engineer. Table 3.3-2 – Construction Criteria Pollutant Emissions summarizes construction-related emissions. Modelling results indicate the Project's construction emissions will not exceed the NCUAQMD's stationary sources emission thresholds in any year of construction. Therefore, the impact from construction emissions would be less than significant.

Table 3.3-2 Construction Criteria Air Pollutant Emissions (tons)

Parameter	ROG	NO _x	PM ₁₀	Carbon Monoxide
Year 1				
Construction Equipment and Fugitive Dust Emissions	0.28	2.38	0.13	2.36
Year 2				
Construction Equipment and Fugitive Dust Emissions	0.25	1.92	0.11	2.27
Annual Threshold	40	40	15	100
Exceed Threshold (Yes or No)	No	No	No	No

Invasive Plant Management and Maintenance

The Project would include prescribed burning of invasive plants, as described in the Methodology section. Additionally, it is estimated that the Project may generate up to 6 visitor trips per day and ongoing invasive plant management through mechanical removal. These activities would be infrequent and short-term in nature. Invasive plant management activities would be substantially less in intensity and duration than construction.

As described above, EPA AP42 emission factors were used to estimate PM₁₀ emissions from prescribed burning of European beachgrass and dense-flowered cordgrass. For the purposes of this analysis, prescribed burning of all 279 acres of European beachgrass and 571 acres of dense-flowered cordgrass were assumed to occur within the same year (conservative analysis). Table 3.3-3 – Annual Invasive Plant Management and Maintenance Criteria Air Pollutant Emissions summarizes annual emissions from invasive plant management and maintenance activities. Modelling results indicate the Project's emissions would not exceed the NCUAQMD's stationary sources emission thresholds under the conservative analysis scenario. Invasive plant management activities would occur for up to ten years or as long as needed to achieve control and/or eradication of dense-flowered cordgrass and European beachgrass. Annual emissions are far below the threshold of significance. Therefore, the impact from invasive plant management and maintenance emissions would be less than significant.

Table 3.3-3 Annual Invasive Plant Management and Maintenance Criteria Air Pollutant Emissions (tons)

Parameter	ROG	NO _x	PM ₁₀	Carbon Monoxide
Mobile (Trips to Project site for invasive plant management, maintenance and public access)	0.02	0.15	0.08	0.35
Invasive Plant Management (Off-road equipment)	0.01	0.08	0.00	0.12
Prescribed Burning (European beach grass)	-	-	0.84	-
Prescribed Burning (dense-flowered cordgrass)	-	-	1.71	-
Annual Total	0.03	0.23	2.63	0.47
Annual Threshold	40	40	15	100
Exceed Threshold (Yes or No)	No	No	No	No

Mitigation Measures: Implement Mitigation Measure AQ-1.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-1 complies with the Basic Construction Measures recommended by air districts to reduce construction-generated dust to a less-than-significant level. Therefore, Impact AQ-2 would be reduced to less than significant with implementation of Mitigation Measure AQ-1.

Impact AQ-3: Would the Project expose sensitive receptors to substantial pollutant concentrations?

The only sensitive receptors within the vicinity include residences approximately 350 feet (107 meters) from the Project Area boundary near Area C and Area D. Due to the large size of the Project Area, invasive plant management activities in the dune restoration area, and construction and invasive plant management activities in Area A, Area B, and Area E would be considerably farther from identified sensitive receptors on Indianola Reservation Road – between 0.5 mile (0.80 kilometer) and 2.0 miles (3.2 kilometers) away.

Construction-Generated Emissions

BAAQMD's Basic Construction Measures included in Mitigation Measure AQ-1 minimize idling times for trucks and equipment to five minutes and ensures construction equipment is maintained in accordance with manufacturer's specifications.

The majority of construction equipment in Area C and Area D would be active at a distance of 350 feet (107 meters) or greater from sensitive receptors. Construction occurring in Area A, Area B, Area E, and the dune restoration area would be considerably farther away. Project construction activities would occur in phased segments throughout the Project Area, and are not expected to include intensive or prolonged construction equipment use in any one location for longer than one year of construction. Due to constraints related to resources other than air quality, construction would generally occur for 131 days or less during any construction season.

Due to the distance from construction activities, and implementation of Mitigation Measure AQ-1 to control fugitive dust, the Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations. Therefore, the construction-related impact would be less than significant with mitigation.

Invasive Plant Management-Generated Emissions

The Project includes prescribed burning as a treatment method for managing invasive plants. Prescribed burns are subject to NCUAQMD Regulation II (Open Burning) and permitting requirements. Regulation II and permitting requirements minimize the potential impact of prescribed burning on sensitive receptors. Additionally, the Project would be required to develop and implement Burn Plans coordinated with the California Department of Forestry and Fire Protection (CAL FIRE), as detailed in Section 2, Project Description, of this Draft EIR. Therefore, invasive plant management activities proposed under the Project would not expose nearby sensitive receptors to substantial levels of pollutants. The invasive plant management-related impact would be less than significant.

Maintenance-Generated Emissions

Temporary and infrequent maintenance activities would occur at the Project Area. Typical emissions expected to occur from maintenance activities include emissions from driving to and from the Project Site. This type of emission is ubiquitous and would not expose nearby sensitive receptors to substantial levels of pollutants. There would be no impact due to maintenance activities.

Mitigation Measures: Implement Mitigation Measure AQ-1.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-1 complies with the Basic Construction Measures recommended by air districts to reduce construction-generated dust that may otherwise reach sensitive receptors to a less than significant level. Therefore, Impact AQ-3 would be reduced to less than significant with implementation of Mitigation Measure AQ-1.

Impact AQ-4: **Would the Project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?**

The Project Area is located in rural Humboldt County and surrounded by open space in most directions. A small neighborhood formerly on the Wiyot Tribe's Table Bluff Reservation is west of the Project Area along Indianola Reservation Road nearest

Area D at the upstream-most extent of McNulty Slough. As noted above, the closest residence to Area D is approximately 350 feet (107 meters) away from the Project Area boundary. Construction would be dispersed throughout the entire Project Area and would not be concentrated adjacent to the residential neighborhood.

The Project would create limited exhaust fumes from the operation of gas and diesel powered equipment during Project construction. The likelihood of these odors and emissions reaching nearby receptors is influenced by atmospheric conditions, specifically wind direction. Should the wind blow odors and emissions toward the adjacent neighborhood, any potential impact would be short-term and temporary, limited to the length of construction on a given day. Due to the distance between residences and the majority of the Project Area, variable atmospheric conditions, the relative short-term nature of construction, and the small number of people residing adjacent to the Project Area, emissions or odors caused by construction of the Project would not adversely affect a substantial amount of people. Therefore, a less than significant impact would occur.

Following construction, implementation of the Project would not result in any major sources of odor or emissions, except for the uncommon use of fuel-powered equipment or minor prescribed burning during ongoing invasive plant management activities. There would be a less than significant impact with the implementation of Mitigation Measure AQ-1.

Mitigation Measures: Implement Mitigation Measure AQ-1.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure AQ-1 complies with the Basic Construction Measures recommended by air districts to reduce construction-generated dust and associated odors to a less-than-significant level. Therefore, Impact AQ-4 would be reduced to less than significant with implementation of Mitigation Measure AQ-1.

3.3.6 Cumulative Impacts

Impact AQ-C-1: Would the Project contribute to a cumulatively significant impact to air quality?

By their nature, air pollution, greenhouse gas emissions and energy usage are largely cumulative impacts. As above, with implementation of Mitigation Measure AQ-1, the Project would not conflict with or obstruct applicable air quality plans or exceed BAAQMD thresholds of significance for criteria air pollutants. A project that would not exceed the BAAQMD thresholds of significance on a project level also would not be considered to result in a cumulatively considerable contribution to these regional air quality impacts. This impact would be cumulatively less than significant.

Mitigation Measures: Implement Mitigation Measure AQ-1.

Level of Significance: Less than significant with mitigation.

3.3.7 References

- California Air Resources Board (CARB). 2016. Ambient Air Quality Standards. Available at: <http://www.arb.ca.gov/research/aaqs/aaqs2.pdf> Accessed on January 26, 2020.
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3.4 Biological Resources

This section evaluates the potential impacts related to biological resources during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. For this section the study area includes the Project Area, McNulty Slough and associated levee systems, the first 500 feet (152 meters) of lower Hawk and Sevenmile sloughs, and the entirety of North Bay upstream of its confluence with the Eel River.

3.4.1 Setting

The Project Area consists of a gently sloping alluvial floodplain that drains east and south via McNulty Slough and North Bay to the Eel River estuary. The Eel River estuary is the fourth largest and one of the most significant estuaries along the California coast. The estuary includes a mosaic of tidal flats, sloughs, marshes, and seasonal wetlands that support resident and migratory birds, fish, mammals, amphibians, reptiles and invertebrate species, as well as a variety of saltmarsh, wetland and upland plants (CDFW 2019a, Schlosser and Eicher 2012; Grassetti et al. 2011). There are approximately 24 square miles (6,216 hectares) of delta lands, wetlands, and estuarine channels that receive runoff from the 3,700 square mile (958,296 hectares) Eel River Basin (CDFG 2010a).

Within the Eel River estuary, many remnant slough channels and streams that were historically interconnected have been disconnected through historical reclamation activities and ongoing agricultural land uses. Current conditions in the Project Area also reflect past land practices. Sometime between 1916 and 1948 to approximately 1986, the Project Area was diked, drained and primarily utilized for agricultural purposes. In 1986, CDFW acquired the currently tidal portion of the Project Area and subsequently subdivided it into five distinct Management Areas using earthen dikes. The five subdivided areas, defined as Areas A through E (see Figure 2-2, Project Area), were managed as shallow freshwater habitat for waterfowl and other native wildlife. In 1994, a levee breach occurred along McNulty Slough (east side of Area A) and caused tidal inundation of Area A. The breach, in combination with subsequent failures of other water control structures within Ocean Ranch and between Ocean Ranch, McNulty Slough and North Bay, resulted in decisions to discontinue management and maintenance of artificial freshwater wetland habitat and allowed most of the area to revert to saltmarsh or brackish marsh (Ducks Unlimited, Inc. 2015). Remnant levees exist between the Management Areas, reducing hydrologic connectivity and aquatic wildlife accessibility between the estuarine restoration area and McNulty Slough and North Bay.

Existing Habitat Conditions

This section contains an overview of the Project Area's existing habitat conditions. Subsequent sections contain more detailed information on the habitat types and sensitive natural resources, including aquatic resources, Sensitive Natural Communities, and special-status plant and wildlife species. Botanical species are referenced in accordance with the Jepson Flora Project (2020) naming convention (Jepson Herbarium 2020). All tidal elevations in this section are presented and analyzed in the North American Vertical Datum of 1988 (NAVD88).

The Project Area, with a total of 850 acres (344 hectares) is broken into two segments for the purpose of management: the estuarine restoration area (571 acres [231 hectares]) and the dunes restoration area (279 acres [113 hectares]). The estuarine restoration area is a wetland complex with tidal channels; mudflats; and salt, brackish and freshwater wetlands. The level of tidal exchange is severely restricted by the existing levee system, and existing channels are inadequate for sufficient tidal circulation. The dunes restoration area, located on a sand spit bordering the ocean, contains a system of coastal dunes and open sand. A small portion of the Project Area (6.3 acres [2.5 hectares]) is comprised of upland levees and access roads within the two restoration areas.

Aquatic resources represent 564.9 acres (228.5 hectares) of the Project Area (Pacific Coast Fish, Wildlife and Wetlands Restoration Association (Pacific Coast Restoration) 2018a). Aquatic resources are wetlands and deepwater habitats that are considered sensitive resources and subject to regulatory protection. Aquatic resources were found mostly in the estuarine restoration area (see Figure 3.4-1, Existing Aquatic Resources).

Eight special-status plant species were found at the Project Area (CDFW 2017, Pacific Coast Restoration 2018b). Three of these species were found in saltmarsh; four in coastal dunes; and one mostly in the transition zone between freshwater marsh and coastal dunes (see Figure 3.4-2, Rare Plant Mapping).

Eleven Sensitive Natural Communities were found at the Project Area (CDFW 2017, CDFW 2018, Pacific Coast Restoration 2018b). Sensitive Natural Communities are plant communities of limited distribution that are considered threatened to some degree. Two of the Sensitive Natural Communities found at the Project Area are associated with coastal salt and brackish marsh habitats; five with freshwater wetland habitats; three with coastal dune habitats; and one with northern coastal scrub habitats (see Figure 3.4-3, Sensitive Natural Communities).

The two most prevalent invasive plant species found at the Project Area are dense-flowered cordgrass and European beachgrass (see Figure 3.4-4, Invasive Plant Communities). Both species are listed by Cal-IPC (2019c) with a risk assessment rating of "high," signifying that they have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure, as well as high rates of dispersal and establishment. At the Project Area, coastal salt and brackish marshes are heavily infested by dense-flowered cordgrass, and coastal dune habitats are heavily infested by European beachgrass. Both of these invasive plant species form dense stands to the exclusion of other plant species, and both pose threats to Sensitive Natural Communities and special status plants at the Project Area.

In North Coast saltmarshes, dense-flowered cordgrass grows most robustly at low to middle tidal elevations, but it is actively encroaching on high elevation marshes as well (Pickart 2001, H. T. Harvey & Associates 2013). Dense-flowered cordgrass is an efficient colonizer of disturbed tidal areas, which necessitates careful control following restoration to prevent re-infestation. Once established, the dense tussocks and root system of the cordgrass limit colonization by other plant species.

European beachgrass impacts native dune plant species through direct competition and by altering sand movement dynamics. European beachgrass grows more densely than its native counterpart, sea lyme grass (*Leymus mollis*), trapping sand and thereby stabilizing dunes and hampering sand movement. This prevents new sand from reaching interior dunes and results in changes to the structure and ecology of dune ecosystems. The lack of sand mobilization to the back dunes impacts native dune mat species, many of which require areas of open sand to persist (Crossman et al. 2017, Pickart and Sawyer 1998).

Habitat Types

This section contains descriptions of the nine habitat types found at the Project Area, with information on where they are found and what types of sensitive resources they support.

Subtidal Channels

Tidal channels are channels that carry tidewater. Water depth in the channels fluctuates with the level of the tide. Subtidal channels are deep enough that they remain flooded even at low tide. Historically, tidal channels allowed unrestricted tidal exchange to much of the low-lying regions of the Project Area. Construction of the levee system restricted tidal exchange, but some of the historical channels remain. In addition, some channels (e.g., borrow ditches) were excavated as part of levee construction and other channels (e.g., drainage ditches) were excavated for agricultural practices. Following the main levee breach in 1994 and subsequent levee and tide gate failures, tidewater was re-introduced at a muted level. Remnant historical channels and ditches now convey tidewater into the interior of the Project Area and flood adjacent lands at high tide. The level of tidal exchange is muted overall and varies widely throughout the Project Area. It is greatest near the main breach to Area A and along the main historical subtidal channel that extends south from the breach site. A second smaller subtidal channel carries tidewater to the north from the breach site. Tidal exchange diminishes further from the breach and at higher elevations in the Project Area.

The conveyance of tidewater via subtidal channels has a major influence on the vegetation of adjacent lands; however, the only vegetation found within the channels themselves are eelgrass beds and macroalgae. Native eelgrass (*Zostera marina*) is considered a sensitive resource because so much of its habitat has been destroyed or is threatened. Eelgrass is an important food source for a number of aquatic organisms and wildlife and also functions as nursery grounds for several types of fish. Eelgrass is present outside of the Project Area within the subtidal channel of McNulty Slough, and may be present in the Project Area (Garwood 2018).

Intertidal Channels/Mudflat

Intertidal channels fill at high tide with an influx of tidewater and are exposed at low tide as tidewaters recede, draining the adjacent mudflats and marshes. Mudflats are large, flat areas that similarly are flooded at high tide and exposed at low tide. Area B, once managed as a freshwater pond, is now largely mudflat that is flooded at high tide and drains slowly at low tide through a culvert in the levee.

Intertidal channels and mudflats support macroalgae beds but are otherwise unvegetated. The channels provide habitat for a number of fish species and other aquatic organisms. Mudflats provide feeding grounds for shorebirds at low tide and are used by waterfowl when flooded at high tide.

Coastal Salt and Brackish Marshes

Coastal salt and brackish marshes form in sheltered areas that are influenced by tidewater exchange. The plants that grow there are adapted to both wet and saline conditions. In general, saltmarshes are found where seawater influence is highest, while brackish marshes are found where there is a mixture of seawater and freshwater influence. Inside the Project Area levees, the extent of salt and brackish marshes has steadily increased in response to muted tidal influence since re-introduction of tidal exchange through the 1994 levee breach. Coastal salt and brackish marshes are now the predominant marsh habitat type found in the Project Area, largely replacing the freshwater wetland complex once managed by CDFW.

Much of the saltmarsh in the Project Area is dominated by the invasive dense-flowered cordgrass. Additionally, two native saltmarsh plant communities are found at the Project Area, one dominated by pickleweed and the other by saltgrass (*Distichlis spicata*). Pickleweed mats are listed by CDFW (2020) as a Sensitive Natural Community. Pickleweed mats at the Project Area support three special status plants: Humboldt Bay owl's clover (*Castilleja ambigua* subsp. *humboldtiensis*), Point Reyes bird's beak (*Chloropyron maritimum* subsp. *palustre*), and Lyngbye's sedge (*Carex lyngbyei*). Patches of Lyngbye's sedge can be found in cordgrass marsh, but the other two sensitive plants do not grow in dense cordgrass. If left uncontrolled, continued expansion of cordgrass marsh at the Project Area poses an ongoing threat to the native saltmarsh communities and all three of the sensitive plants mentioned.

Brackish marshes at the Project Area are dominated by a mixture of saltmarsh bulrush (*Bolboschoenus maritimus* subsp. *paludosus*) and/or three-square bulrush (*Schoenoplectus pungens* var. *longispicatus*). Saltmarsh bulrush is listed by CDFW (2020) as a Sensitive Natural Community, and it is also threatened by dense-flowered cordgrass.

Fresh to Slightly Brackish Marshes

Freshwater marshes are predominantly influenced by freshwater sources such as creeks or other drainages, seeps and springs, or rainwater that ponds where drainage is poor. Freshwater marshes are found in the northern regions of the Project Area, where several drainages convey rainwater runoff from Table Bluff. These marshes are often slightly brackish at their interface with adjacent salt and brackish marshes. Prior to the 1994 levee breach, much of the Project Area was managed as a freshwater wetland complex. Since that time, freshwater marshes

have steadily declined as they have been replaced by salt and brackish marshes or by mudflats.

While less extensive than salt and brackish marshes, freshwater marsh plant communities found at the Project Area are more diverse. Marshes dominated by either slough sedge (*Carex obnupta*), salt rush (*Juncus lescurii*), water-parsley (*Oenanthe sarmentosa*), or Pacific silverweed (*Argentina egedii* subsp. *egedii*) are listed by CDFW (2020) as a Sensitive Natural Community. Two additional freshwater marsh plant communities found at the Project Area are those dominated by common cattail (*Typha latifolia*) or hardstem bulrush (*Schoenoplectus acutus*).

Fresh to slightly brackish marshes at the Project Area support one sensitive plant, seacoast angelica (*Angelica lucida*), especially in the transition zone between marsh and coastal dunes.

Freshwater Shrub Wetlands

Freshwater shrub wetlands are often associated with creeks and other drainages. A small amount of freshwater shrub wetlands dominated by coastal dune willow (*Salix hookeriana*) are found in the northern regions of the Project Area. Coastal dune willow thickets are listed by CDFW (2020) as a Sensitive Natural Community.

Freshwater Pond

There is one small freshwater pond located in the southwest region of the Project Area. It is a freshwater seep that was impounded on the inside of the perimeter levee by levee extensions. The pond does not appear to have any tidal influence. The water level in the pond does not fluctuate with the tidal cycle. Fresh to slightly brackish marsh vegetation grows on the edges of the pond.

Coastal Dunes

Coastal dunes form as onshore winds blow sand inland and the sand accumulates into hills or ridges. As sand accumulates, plants adapted to the sandy environment colonize, stabilizing the surface and promoting further dune formation. Coastal dunes are found just inland of the beach in the western region of the Project Area. While invasive European beachgrass dominates much of the dunes at the Project Area, two native plant communities are also found there, and both are listed by CDFW (2020) as Sensitive Natural Communities. The first is dominated by sea lyme grass. In natural systems, sea lyme grass colonizes the primary foredune (the dune ridge closest to the beach), but in the Project Area, sea lyme grass has been almost entirely outcompeted and replaced by European beachgrass.

The second Sensitive Natural Community found at the Project Area is known as dune mat. It is found in the foredune complex inland of the primary foredune and it is more extensive than sea lyme grass patches at the Project Area. Dune mat is composed mostly of a mix of mat-forming plants with variable and often sparse cover. Dune mat at the Project Area supports four special status plants: beach layia (*Layia carnosa*), dark-eyed gilia (*Gilia millefoliata*), short-leaved evax (*Hesperrevax sparsiflora* var. *brevifolia*), and American glehnia (*Glehnia littoralis* subsp. *leiocarpa*). If left uncontrolled, continued expansion by European beachgrass at the Project Area poses an ongoing threat to the native dune communities and all four of the sensitive plants mentioned.

While dune mat is generally considered an upland plant community, it contains plants that are also tolerant of wet soils. One such plant, brewer's rush (*Juncus brewerii*), is common along the eastern edge of dune habitat at the Project Area. Areas dominated by brewer's rush meet some regulatory definitions of wetland and are protected under those regulations.

Northern Coastal Scrub

Northern coastal scrub is an upland habitat characterized by various shrubs. Two northern coastal scrub plant communities are found at the Project Area, and neither are abundant. Coyote brush scrub (*Baccharis pilularis* subsp. *consanguinea*) is found primarily on the top and sides of levees throughout the Project Area. The second type is coastal brambles, dominated by a mixture of the native California blackberry (*Rubus ursinus*) and the invasive Himalayan blackberry (*Rubus armeniacus*). Coastal brambles are found on levees, often mixed with coyote brush scrub. Coastal brambles are also found growing along fencelines and in patches at the upper margins of marshes at the Project Area.

Plant communities dominated by native California blackberry are listed as sensitive by CDFW (2020). Scattered individuals of the sensitive plant seaside angelica can be found growing in northern coastal scrub habitat on the sides of levees at the Project Area.

Ruderal

Ruderal habitats are disturbed areas generally vegetated by non-native, sometimes invasive, plant species. Ruderal habitats are not extensive at the Project Area. They are found at the upper margins of marshes and along levees and access roads, mostly in the northern region of the Project Area. They are dominated by non-native grasses such as tall fescue (*Festuca arundinacea*), common velvet grass (*Holcus lanatus*), and sweet vernal grass (*Anthoxanthum odoratum*); and/or by wild radish (*Raphanus* spp.). Some of these weedy plants, referred to as facultative plants, are tolerant of both dry and wet soils. Areas dominated by facultative plants meet some regulatory definitions of wetland and are protected under those regulations.

Aquatic Resources

An investigation of aquatic resources potentially subject to federal and state regulation within the Project Area was conducted by Pacific Coast Fish, Wildlife and Wetlands Restoration Association in the spring and summer of 2018 (Pacific Coast Restoration 2018a). The entire Project Area was surveyed to determine the acreage and location of aquatic resources potentially subject to the following regulations:

- Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act as administered by the United States Army Corps of Engineers (USACE);
- The Porter Cologne Water Quality Control Act and Section 401 of the CWA as administered by the North Coast Regional Water Quality Control Board (NCRWQCB); and

- The federal Coastal Zone Management Act and Sections 30233 and 30240 of the California Coastal Act (Coastal Act) as administered by the California Coastal Commission (CCC).

Aquatic resources found in the Project Area included wetlands and other waters of the U.S and State. Wetlands were identified and mapped based on an assessment of three parameters: vegetation, soils, and hydrology. Pacific Coast Restoration (2018a) found 524.1 acres (212.1 hectares) of aquatic resources potentially under the jurisdiction of the USACE and the NCRWQCB, comprised of 350.3 acres (141.7 hectares) of three-parameter wetlands, and 173.8 acres [70.3 hectares] of other waters of the U.S./State. These aquatic resources plus an additional 40.8 acres [16.5 hectares] of one-parameter wetlands, totaling 564.9 acres (228.6 hectares), are all potentially under the jurisdiction of the CCC (Pacific Coast Restoration 2018a). See Figure 3.4-1 (Existing Aquatic Resources) for a visual representation of aquatic resources mapped within the Project Area, and Table 3.4-1 for a summary of aquatic resources in the Project Area.

Table 3.4-1 Aquatic Resources in the Project Area

Aquatic Resource Type	Acres
<i>Three-parameter wetlands</i>	350.3
Coastal salt and brackish marsh	306.5
Fresh to slightly brackish marsh	36.9
Freshwater shrub wetland	6.9
<i>One-parameter wetlands</i>	40.8
Brewer's rush dunes	33.4
Ruderal (facultative)	7.4
<i>Other Waters of the U.S./State</i>	173.8
Subtidal channel	11.7
Intertidal mudflat/channel	161.9
Freshwater pond	0.2
Total Aquatic Resources	564.9

Adapted from: Pacific Coast Restoration 2018a

Sensitive Natural Communities

Sensitive Natural Communities are plant communities that are of limited distribution statewide or within a county or region (see Section 3.4-2, Regulatory Framework, State, Sensitive Natural Communities). The distribution of these plant communities was mapped by Golec and Miller (CDFW 2017) and amended by Leppig (CDFW 2018) to include additional staging and access areas on the north side of the Ocean Ranch Unit that could be impacted by the Project. Table 3.4-2 and Figure 3.4-3 (Sensitive Natural Communities) list and depict, respectfully, the Sensitive Natural Communities mapped within the Project Area in 2017 and 2018.

Table 3.4-2 Sensitive Natural Communities in the Project Area

Scientific Name	Common Name	Associated Habitat Type	Global/State Rarity
<i>Abronia latifolia</i> - <i>Ambrosia chamissonis</i> Herbaceous Alliance	dune mat	Coastal dunes	G3/S3
<i>Argentina egedii</i> Herbaceous Alliance	Pacific silverweed marshes	Fresh to slightly brackish marsh	G4/S2
<i>Bolboschoenus maritimus</i> Herbaceous Alliance	salt marsh bulrush marshes	Brackish marsh	G4/S3
<i>Carex obnupta</i> Herbaceous Alliance	slough sedge swards	Fresh to slightly brackish marsh	G4/S3
<i>Carex pansa</i> Herbaceous Alliance	sand dune sedge swaths	Coastal dunes	G4?/S3?
<i>Juncus lescurii</i> Herbaceous Alliance	salt rush swales	Fresh to slightly brackish marsh	G3/S2?
<i>Leymus mollis</i> Herbaceous Alliance	sea lyme grass patches	Coastal dunes	G4/S2
<i>Oenanthe sarmentosa</i> Herbaceous Alliance	water parsley marshes	Fresh to slightly brackish marsh	G4/S2?
<i>Rubus ursinus</i> Shrubland Alliance	coastal brambles	Northern coastal scrub	G4/S3
<i>Salicornia pacifica</i> Herbaceous Alliance	pickleweed mats	Coastal salt marsh	G4/S3
<i>Salix hookeriana</i> Shrubland Alliance	coastal dune willow thickets	Freshwater shrub wetland	G4/S3

Information compiled from: CDFW 2017; CDFW 2018; Pacific Coast Restoration 2018b; CNPS 2019.

Key to status codes:

G1/S1: Critically Imperiled

G2/S2: Imperiled

G3/S3: Vulnerable

G4/S4: Apparently Secure

G5/S5: Secure

Special-Status Plant Species

Pacific Coast Restoration (2018b) performed an assessment of special-status plants at the Project Area. Queries of the California Natural Diversity Database (CNDDDB) (CDFW 2017) and the California Native Plant Society (CNPS 2018) yielded a list of 53 special-status plant species that were previously documented in the vicinity of the Project Area. Of this total, 23 species grow in habitat types, soil types or elevations not found in the Project Area, and the remaining 30 species were considered to have some potential for occurring at the Project Area. Sixteen of the 30 had CNDDDB records (some historical only) within a 5-mile radius of the Project Area. For details on the results of this assessment, refer to Pacific Coast Restoration (2018b).

Pacific Coast Restoration (2018b) also conducted a comprehensive floristic survey of the Project Area between April 26 and July 28, 2018. Eight special-status plant species were found (Table 3.4-3, Figure 3.4-2), all previously documented at the Project Area by either Golec and Miller (CDFW 2017) or USFWS (2018).

A description of the listing status, habitat characteristics, and known location within the Project Area for these eight species is provided below. In addition, information on two unobserved but State and Federally listed plant species with low potential of occurring at the Project Area - Menzies' wallflower (*Erysimum menziesii*) and western lily (*Lilium occidentale*) - are provided below. Information is also presented on eelgrass meadows, which were documented in McNulty Slough in the study area by Garwood (2018).

Table 3.4-3. Special-status Plants Present in the Project Area

Special-status Plants			Occupied Habitat (Acres)
Scientific Name	Common Name	Annual/Peren	
<i>Angelica lucida</i>	seacoast angelica	Perennial	14.93
<i>Carex lyngbyei</i>	Lyngbye's sedge	Perennial	0.74
<i>Castilleja ambigua</i> subsp. <i>humboldtiensis</i>	Humboldt Bay owl's clover	Annual	1.38
<i>Chloropyron maritimum</i> subsp. <i>palustre</i>	Point Reyes bird's-beak	Annual	1.18
<i>Gilia millefoliata</i>	dark-eyed gilia	Annual	22.86
<i>Glehnia littoralis</i> subsp. <i>leiocarpa</i>	American glehnia	Perennial	0.02
<i>Hesperervax sparsiflora</i> var. <i>brevifolia</i>	short-leaved evax	Annual	26.61
<i>Layia carnosa</i>	beach layia	Annual	34.00

Adapted from: Pacific Coast Restoration (2018b)

Seacoast angelica (*Angelica lucida*) CRPR 4.2. Present.

Seacoast angelica has no state or federal listing status and has a California Rare Plant Rank (CRPR) of 4.2 due to its limited distribution in California; its status should be monitored according to CNPS (2019). It is a perennial species, found in coastal bluff scrub, coastal dunes, coastal scrub, marshes and swamps at elevations between 0 and 490 feet (0 to 149 meters). Large stands of seacoast angelica were found in the transition zone between freshwater marsh and coastal dune habitats in Area A (northwestern region) and Area E. Seacoast angelica was also found growing on the sides of levees in northern coastal scrub (Figure 3.4-2) (Pacific Coast Restoration 2018b). This species was also documented sparsely along McNulty Slough in Area C.

Lyngbye's Sedge (*Carex lyngbyei*) CRPR 2B.2. Present.

Lyngbye's sedge has no state or federal listing status and a CRPR 2B.2 ranking, as it is found only in coastal wetlands along the intertidal/upland interfaces from Marin to Del Norte 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. Small amounts of Lyngbye's sedge were found in coastal salt marsh, mostly in Area A and bordering McNulty Slough, including a few small, dense patches growing on the edges of dense-flowered cordgrass marsh (Pacific Coast Restoration 2018b) (Figure 3.4-2).

Humboldt Bay owl's-clover (*Castilleja ambigua* subsp. *humboldtiensis*) CRPR 1B.2. Present.

Humboldt Bay owl's-clover has no state or federal listing status and has a CRPR 1B.2 ranking, as it occurs in very limited areas along the northern California coast in salt marsh habitats (CNPS 2019). It is an annual hemiparasitic herb that forms root connections with host plants from which it derives some of its resources. Humboldt Bay owl's-clover often occurs in large groups (over 100 individuals) due to the seeds being carried and deposited to a specific location by the tide. Within the Project Area, this species was observed at the upper margins of coastal saltmarsh habitat, mostly in the southern portion of Area A bordering McNulty Slough (Pacific Coast Restoration 2018b) (Figure 3.4-2).

Point Reyes bird's-beak (*Chloropyron maritimum* subsp. *palustre*) CRPR 1B.2. Present.

Point Reyes bird's-beak has no state or federal listing status and has a CRPR 1B.2 ranking, as it occurs in very limited areas along the northern California coast in saltmarsh habitats (CNPS 2019). It is an annual hemiparasitic herb that forms root connections with host plants from which it derives some of its resources. Within the Project Area, this species was observed at the upper margins of coastal saltmarsh habitat, mostly in the southern portion of Area A bordering McNulty Slough (Pacific Coast Restoration 2018b) (Figure 3.4-2).

Dark-eyed gilia (*Gilia millefoliata*) CRPR 1B.2. Present.

Dark-eyed gilia has no state or federal listing status and is ranked 1B.2 on the CRPR list, as its distribution in California is largely limited to coastal strand and stabilized dune habitats. Within the Project Area, this annual herb is found in the dune restoration area, and specifically within the dune mat plant community. Dark-eyed

gilia was found in areas with open sand, and also tolerated areas with moderate vegetation cover (Pacific Coast Restoration 2018b) (Figure 3.4-2).

American glehnia (*Glehnia littoralis* subsp. *leiocarpa*) CRPR 4.2. Present.

American glehnia has no state or federal listing status and has a CRPR 4.2 ranking as its of limited distribution in California; its status should be monitored according to CNPS (2019). This species is a perennial herb and can be found in coastal dunes (CNPS 2019). Within the Project Area, this species was found growing in a few dune mat plant community locations in the northern portion of Area A and Area E (Pacific Coast Restoration 2018b) (Figure 3.4-2).

Short-leaved evax (*Hesperevax sparsiflora* var. *brevifolia*) CRPR 1B.2. Present.

Short-leaved evax has no State or Federal listing status and has a CRPR 1B.2 ranking, as its distribution in California is largely limited to coastal strand, northern coastal scrub and dune habitats (CNPS 2019). Within the Project Area, this species is present in coastal dune habitat in the southern and central dune restoration area. Short-leaved evax was found in areas with moderate vegetation cover, and it also showed a tolerance for some degree of compaction, as it was found in portions of vehicle access routes (though not in active tire tracks with high levels of sand disturbance) (Pacific Coast Restoration 2018b) (Figure 3.4-2).

Beach layia (*Layia carnosa*) FE; SE; CRPR 1B.1. Present.

Beach layia is a State and Federally listed endangered species and a CRPR 1B.1 ranking documented from approximately 20 occurrences in eight dune systems between Freshwater Lagoon in Humboldt County and Vandenberg Air Force Based in Santa Barbara County (USFWS 2017a). The largest extant occurrences are currently known from dunes in Humboldt County (CNPS 2019). Beach layia is a succulent-like, annual herb ranging from a single stem to many branched individual stems up to six inches tall and 16 inches in breadth, in part depending on substrate 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 (i.e., dune mat). It does not grow in areas where there is high cover of native or non-native plants; therefore, encroachment by non-native species, particularly those that stabilize dunes and form dense stands (e.g., European beachgrass) pose threats to the species (USFWS 2011). Within the Project Area, beach layia was observed in dune mat within the proposed dune restoration area. There were two large, disjunct concentrations of beach layia in the Project Area: one in the north, and the other on the southern part of the sand spit (USFWS 2018, Pacific Coast Restoration 2018b) (Figure 3.4-2). In 2017, CDFW assisted the USFWS with beach layia data collection and occurrence data and estimated that 4.7 million beach layia occurred within suitable habitat in the Project Area (USFWS 2018).

Menzies' wallflower (*Erysimum menziesii*) FE; SE; CRPR 1B.1. Low Potential.

Menzies' wallflower, which has not been documented in the Project Area, is a State and Federally listed endangered species and has a CRPR 1B.1 ranking documented from approximately 16 occurrences scattered across dune systems, including the

foredune complex and low-lying deflation plane (Pickart and Sawyer 1998) on sand spits bordering Humboldt Bay in Humboldt County, Ten Mile River in Mendocino County, and the Marina Dunes (Monterey Bay) and Monterey Peninsula in Monterey County (USFWS 2017b). 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 (USFWS 2008). A small population of Menzies' wallflower occurs at the north end of the south spit of Humboldt Bay, which is actively managed by USFWS, the Bureau of Land Management (BLM) and the Wiyot Tribe (M. van Hattem, pers. comm. 2019).

Western lily (*Lilium occidentale*) FE; SE; CRPR 1B.1. Low potential.

Western lily is a State and Federally listed endangered species and has a CRPR 1B.1 ranking. It has been documented from within four miles (6.4 kilometers) of the coast, from Coos County, Oregon to Loleta, California. This species is not known to the Project Area; however, a population of western lily exists approximately 0.25 mile (0.4 kilometer) (at its closest point) from the Project Area at the Sitka spruce dominated Table Bluff Ecological Reserve owned and managed by CDFW (CDFW 2014). The western lily grows at the edges of bogs and in forest openings along the margins of ephemeral ponds and small channels (USFWS 2017c). It is a wetland adapted plant and is often found within freshwater bogs, fens, coastal scrub and coastal prairie, and along the ecotone of different vegetation types. It occurs in a coastal cool season Mediterranean-type climate, where summers are dry and windy and winters are wet and relatively warm. This species occurs in one of two soil conditions: mineral soils that possess an impermeable layer that serves to maintain moisture late into the growing season, or organic marsh soils in which a fluctuating water table temporarily inundates the bulbs, but which drops below the level of the bulbs by mid to late spring (USFWS 2009).

Eelgrass (*Zostera marina*) Habitat protected by Federal and State regulation; Present

Eelgrass is a highly productive species and is considered a “foundation” or habitat forming species as it is a primary and secondary producer, substrate for epiphytes and epifauna, and a sediment stabilizer and nutrient cycling facilitator (NMFS 2014a). Under the National Marine Fisheries Service's (NMFS) “no net loss” wetlands policy, eelgrass is protected for its habitat and habitat values. Eelgrass provides ecological services for a variety of fish, bird, and invertebrate species, including species that have important cultural, commercial, and recreational values to the region. In northern California the eelgrass low growth season occurs between October and April, and the high growth season begins in April where eelgrass gradually forms localized stands during summer months (NMFS 2014a). In the Eel River estuary, eelgrass occurs in saline to brackish portions of the estuary, including the documented population in McNulty Slough (Garwood 2018) (Figure 3.4-3). According to Garwood (2018), a total of 20.43 acres (8.27 hectares) of eelgrass were documented during the June 29, 2018 survey of McNulty Slough, with all observed eelgrass occurring within a 0.85 mile (1.4 kilometers) section adjacent to the southern portion of the Project Area. The 2018 survey did not include waters inside the Ocean Ranch Unit breach. Dwarf eelgrass, which has previously been observed in the upper reaches of McNulty Slough, was not observed during the 2018 survey.

Wildlife Resources

A wide diversity of wildlife species utilize the study area, including birds, amphibians, reptiles, and mammals. Wildlife distribution across the study area varies seasonally and is based on vegetation types, water depths, and water salinities. A variety of habitat types such as coastal salt and brackish marsh, intertidal channel/mudflat/freshwater to brackish marsh, freshwater ponds, dunes, and northern coastal scrub provide habitat for a significant number and variety of avian species. 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 and heron/egrets are generally observed foraging in aquatic portions of the study area. Passerines can be found in wetland and shrub habitat across the study area and the ephemeral wetlands at the Project Area likely provide foraging habitat for many insectivorous passerine species.

The study area has a high diversity of avian species throughout the year, with a total of 204 species documented in the Project vicinity (eBird 2019, CDFW 2019a). Of the total, approximately four special-status avian species are known or have a high potential to nest in the Project Area due to the presence of suitable habitat including: American Bittern (*Botaurus lentiginosus*), Western Snowy Plover (*Charadrius nivosus nivosus*), Northern Harrier (*Circus hudsonius*), and Bryant's Savannah Sparrow (*Passerculus sandwichensis alaudinus*). The federally protected Western Snowy Plover is known both to nest and winter on the wave slope, high beach and terminus of the spit within the dune restoration area (Colwell 2019).

Northern Red-legged Frog (*Rana aurora*) breed in limited freshwater habitats within the study area and utilize upland habitat for non-breeding habitat. There are numerous records of this species from the Project vicinity (CDFW 2019a, iNaturalist 2019). In 2010, CDFW surveyed suitable breeding habitat within the Ocean Ranch Unit and observed sixty egg masses restricted to the northern portion of Area E and to a lesser extent Area C (CDFG 2010b). Personal observation by Ken Mierzwa (GHD) provides confirmation for species presence immediately southeast of the Project Area (K. Mierzwa pers. comm. 2018). In addition, there is potential aquatic habitat for Western Pond Turtle in the northern portion of Area E where freshwater occurs; however, these turtles are ectothermic (cold blooded) and therefore thermally challenged for basking requirements due to close proximity to the coast. CDFW has observed a single sub-adult Western Pond Turtle (J. Olson pers. comm. 2018) north of Area E within the dunes, but the population is likely small for the aforementioned reasons. Regional populations of Western Pond Turtle, generally located north of San Francisco Bay, are considered the Northwestern Pond Turtle (*Emys marmorata marmorata*) (California Herps 2019) and are hereafter referred to as such in this Draft EIR.

Special-status bat species may also occur in the Project Area, as the study area provides a wide variety of foraging habitats that likely support diverse insect prey. Although no occurrence data on bats is available for the Project Area, nearby BatAMP records from Lanphere Dunes (which is forested) show that Townsend's and Hoary Bat are present there (Weller 2015). The Project Area is not forested, rather it contains shrubs and saltmarsh vegetation, but may support the possibility of special-status bats foraging onsite.

Several reports document the importance of the Eel River estuary (Puckett 1977), including McNulty Slough and the Project Area, for salmonids and other marine species. Water quality and fish surveys (seining and minnow trapping) conducted in McNulty Slough and the Project Area between February and October 2007 did not find salmonids, although water quality conditions were suitable to support juvenile rearing and outmigration in the Project Area (Wallace and Gilroy 2008). Surveys of McNulty Slough, North Bay and Hawk Slough conducted between January 2008 and June 2009 found 28 fish species including juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) and Coho Salmon (*O. kisutch*); juvenile and adult Steelhead Trout (*O. mykiss*); and Longfin Smelt (*Spirinchus thaleichthys*) (Scheiff et al. 2013). The anadromous salmonids and Longfin Smelt were captured in McNulty Slough. In 2018, fish surveys were conducted by CDFW in the Project Area using beach seines, a channel net and minnow traps (Ray 2018a); 12 fish species were found including a juvenile Chinook Salmon, which was the first record of a juvenile salmonid in the study area outside of McNulty Slough. The most numerically dominant species identified in 2018 were Topsmelt (*Atherinops affinis*), Pacific Staghorn Sculpin (*Leptocottus armatus*), and Shiner Perch (*Cymatogaster aggregata*); Threespine Stickleback (*Gasterosteus aculeatus*), Prickly Sculpin (*Cottus asper*), Northern Anchovy (*Engraulis mordax*), Surf Smelt (*Hypomesus pretiosus*), Starry Flounder (*Platichthys stellatus*), English Sole (*Parophrys vetulus*), Sacramento Pikeminnow (*Ptychocheilus grandis*), and Saddleback Gunnel (*Pholis ornata*) were also present (Ray 2018a). Invertebrates found during the 2018 survey included Crangon Shrimp (*Crangon spp.*), Yellow Shore Crab (*Hemigrapsus oregonensis*), and Dungeness Crab (*Metacarcinus magister*) (Ray 2018a).

The 2018 fish surveys did not find Tidewater Goby (*Eucyclogobius newberryi*) in the Project Area, which was likely due to the sampling equipment used (CDFW 2018a). Sampling was terminated after three hours because tidal flow velocity decreased significantly making the channel net inefficient and dangerous for fish (Ray 2018a). Two other surveys to determine presence/absence of Tidewater Goby were conducted in 2012 (Scheiff and Gilroy 2013) and 2017 (Ray 2018b). The 2012 survey yielded a total of 85 Tidewater Goby at 13 of the 31 sampled sites, and the 2017 survey yielded 24 Tidewater Goby at seven of the 31 sampled sites (Scheiff and Gilroy 2013, Ray 2018b). Most of the sites where Tidewater Goby were present were located in the northern portion of Areas A and E, which represents the most important areas of habitat for the species within the Project Area (Ray 2018b).

Marine mammal species documented within McNulty Slough include Pacific Harbor Seal (*Phoca vitulina richardii*) and California Sea Lion (*Zalophus californianus*) (M. van Hattem pers. comm. 2019). Additional marine mammals expected to utilize deep ocean habitat west of the Project Area include: Blue Whale (*Balaenoptera musculus*), Gray Whale (*Eschrichtius robustus*), Humpback Whale (*Megaptera novaeangliae*) and Orca Whale (*Orcinus orca*).

Special-Status Wildlife Species

Table 3.4-4 summarizes the special-status wildlife species and their potential to occur in the study area based on review of the CNDDDB, USFWS species list, and personal communication with CDFW staff. Of these, 34 special-status wildlife species have been determined to have a moderate to high potential to occur in the

study area based on habitat requirements, species range, and known occurrences proximate to the study area (including observation in the study area during preliminary surveys). A detailed account of these 34 species, including a description of their habitat and known distribution, is provided in Appendix B. For the remaining species, the study area either lacks potentially suitable habitat or may contain potential habitat, but the habitat is minimal to the extent that the occurrence of special-status species is unlikely.

Table 3.4-4 Potential for Special-status Wildlife Species to Occur within the Study Area

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
MAMMALS			
Pallid Bat <i>Antrozous pallidus</i>	SSC, S3, WBWG High Priority	Habitats include chaparral, coastal scrub, desert wash, Great Basin grassland, Great Basin scrub, Mojave Desert scrub, riparian woodland, Sonoran Desert scrub, upper montane coniferous forest, and valley & foothill grassland. The species prefers deserts, grasslands, shrublands, woodlands, and forests. They are most common in open, dry habitats with rocky areas for roosting. Roosts must protect bats from high temperatures. They are very sensitive to disturbance of roosting sites.	Low Potential. The Project Area does not provide xeric habitat preferred by this species. The closest record of this species from the Project vicinity is from a specimen collected in Ferndale in 1924 (CDFW 2019a).
Townsend's Big-eared Bat <i>Corynorhinus townsendii</i>	SSC, S2, WBWG High Priority	Habitats include broadleaved upland forest, chaparral, chenopod scrub, Great Basin grassland, Great Basin scrub, Joshua tree woodland, Lower montane coniferous forest, meadow & seep, Mojavean desert scrub, riparian forest, riparian woodland, Sonoran desert scrub, Sonoran thorn woodland, upper montane coniferous forest, valley & foothill grassland. The species is found in a wide variety of habitats throughout California, although it is most common in mesic sites. They roost in the open, hanging from walls and ceilings. Roosting sites are limiting. This species is extremely sensitive to human disturbance.	Moderate Potential. No records of the species from the immediate area. Closest known record is from 2015 at Lanphere Dunes (Weller 2015), although recent surveys detected possible presence near the Salt River. Species roosts in a variety of structures includes hollow trees, buildings (barns), and lava tubes, and winters in caves. No roosting habitat exists within the Project Area. Foraging habitat for the species could be present in the Project Area.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Hoary Bat <i>Lasiurus cinereus</i>	S4, WBWG Medium Priority	Habitats include broadleaved upland forest, cismontane woodland, lower montane coniferous forest, and North Coast coniferous forest. The species prefers open habitats or habitat mosaics, with access to trees for cover and open areas or habitat edges for feeding. In addition, they roost in dense foliage of medium to large trees, feed primarily on moths, and require water.	Moderate Potential. No records of the species from the immediate area. Closest known record is from 2015 at Lanphere Dunes (Weller 2015). No roosting habitat exists within the Project Area, however this species may roost in trees within the Project vicinity. Foraging habitat for the species could be present in the Project Area.
Humboldt Mountain Beaver <i>Aplodontia rufa humboldtiana</i>	SNR	Habitats include coastal scrub, redwood (<i>Sequoia sempervirens</i>), and riparian forest. The species inhabits the coast Range in southwestern Del Norte County and northwestern Humboldt County. Preferred microhabitat includes a variety of coastal habitats, including coastal scrub and riparian forests, typically with open canopy and thickly vegetated understory.	Low Potential. Although there are historical records of this species from the county and suitable coastal scrub habitat is present, there are no recent records of this species from the Project Area (Steele 1989, CDFW 2019a). Table Bluff north of the Project Area contains suitable habitat and would be unaffected by the Project. Occurrence within Project Area unlikely but not impossible.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Sonoma Tree Vole <i>Arborimus pomo</i>	SSC, S3	Habitats include North Coast coniferous forest, old growth, and redwood. The species inhabits the North Coast fog belt from the Oregon border to Sonoma County and is found most-commonly in Douglas-fir (<i>Pseudotsuga menziesii</i>), redwood & montane hardwood-conifer forests. The species feeds almost exclusively on Douglas-fir needles but will occasionally feed on needles of grand fir, hemlock or spruce.	Low Potential. There are no records of this species within the Project Area (CDFW 2019a). There are no coniferous trees in the Project Area, however some coniferous trees exist on adjacent properties. The Project Area does not contain suitable habitat for this species.
North American Porcupine <i>Erethizon dorsatum</i>	S3	Habitats include broadleaved upland forest, cismontane woodland, closed-cone coniferous forest, lower montane coniferous forest, North Coast coniferous forest, and upper montane coniferous forest. The species prefers forested habitats in the Sierra Nevada, Cascade, and Coast ranges, with scattered observations from forested areas in the Transverse Ranges. They utilize a wide variety of coniferous and mixed woodland habitat.	Low Potential. No suitable large patches of riparian forest/coniferous forest or woodland habitat are present in the Project Area. Known to occur to the south within the Eel River Estuary Preserve.
Fisher - West Coast Distinct Population Segment (DPS) <i>Pekania pennanti</i>	ST, SSC, S2S3	Habitats include North Coast coniferous forest, old growth, and riparian forest. The species prefers intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Microhabitat includes cavities, snags, logs and rocky areas for cover and denning. The species needs large areas of mature, dense forest.	Low Potential. No records are known from the Project Area (CDFW 2019a). No suitable old growth coniferous forest habitat (for foraging and denning) is present on or directly adjacent to the Project Area.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Pacific Harbor Seal <i>Phoca vitulina richardii</i>	MMPA Protection	This species is found all along the California coast. They favor near-shore coastal waters and are often seen on rocky islands, sandy beaches, mudflats, bays and estuaries (Marine Mammal Center 2019).	High Potential. Known to Occur in Study Area. This species has been observed within McNulty Slough adjacent to the Project Area (M. van Hattem pers. comm. 2019). Suitable habitat for this species is also available along the beach within the dune restoration area.
California Sea Lion <i>Zalophus californianus</i>	MMPA Protection	This species is found all along the California coast. They inhabit rocky and sandy beaches of coastal islands and mainland shorelines, and may frequent sandbars, sheltered coves, tide pools, and structures such as piers, jetties and buoy (Marine Mammal Center 2019).	High Potential. Known to Occur Study Area. This species has been observed within McNulty Slough adjacent to the Project Area (M. van Hattem pers. Comm. 2019). Suitable habitat for this species is also available along the beach within the dune restoration area.
BIRDS			
Sharp-shinned Hawk <i>Accipiter striatus</i>	CWL, S4	Habitat includes cismontane woodland, lower montane coniferous forest, riparian forest, and riparian woodland. The species inhabits ponderosa pine (<i>Pinus ponderosa</i>), black oak (<i>Quercus kelloggii</i>), riparian deciduous, mixed conifer, and Jeffrey pine (<i>Pinus jeffreyi</i>) habitats. Prefers riparian areas. Microhabitat preferences include north-facing slopes with plucking perches. Nests are usually within 275 feet (84 meters) of water.	Low Potential. Fly-over or Foraging Only. There is no suitable extensive forested habitat (for breeding or foraging) on or directly adjacent to the Project Area. The study area may provide foraging habitat for the species.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Tricolored Blackbird <i>Agelaius tricolor</i>	BCC, ST, SSC, S1S2	Habitat includes freshwater marsh, swamp, and wetlands. This is a highly colonial species, most numerous in the Central Valley and Sierra foothills. Largely endemic to California. The species requires open water, protected nesting substrate, and foraging area with insect prey within a few kilometers of the colony.	Low Potential. Foraging and Nesting. The closest known records of this species to the Project Area are from the Loleta Bottoms. Suitable nesting habitat associated with brackish and freshwater marsh vegetation in the Project Area. Based on available habitat (saltwater marsh/tidal slough), the species is unlikely to occur in the Project Area (eBird 2019).
Grasshopper Sparrow <i>Ammodramus savannarum</i>	SSC, S3	The species inhabits dense grasslands on rolling hills, lowland plains, in valleys and on hillsides on lower mountain slopes. The species favors native grasslands with a mix of grasses, forbs and scattered shrubs. Loosely colonial when nesting.	Low Potential. Foraging and Nesting. The closest known record of this species to the Project Area is from Table Bluff Road near Copenhagen Road (adjacent to grassland). Suitable nesting habitat associated with dry, upland areas of grassy vegetation in the Project Area. Based on available habitat, the species is unlikely to occur in the Project Area but cannot be completely ruled out (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Great Egret <i>Ardea alba</i>	S4	Habitat includes brackish marsh, estuary, freshwater marsh, marsh & swamp, riparian forest, and wetlands. The species nest colonially in large trees. Rookery sites are located near marshes, tide-flats, irrigated pastures, and margins of rivers and lakes.	High Potential. Foraging Only. Known to Occur in Study Area. There are numerous records of this species from the Project Area and requisite foraging habitat is present in the Project Area. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019), and an existing rookery exists on the south end of Humboldt Bay (M. van Hattem pers. comm. 2019).
Great Blue Heron <i>Ardea herodias</i>	S4	Habitat includes brackish marsh, estuary, freshwater, marsh, marsh & swamp, riparian forest, and wetlands. Species is a colonial nester in tall trees, cliffsides, and sequestered spots on marshes. Rookery sites are in close proximity to foraging areas: marshes, lake margins, tide-flats, rivers and streams, and wet meadows.	High Potential. Foraging Only. Known to Occur in Study Area. There are numerous records of this species from the Project Area. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019).
Short-eared Owl <i>Asio flammeus</i>	SSC, S3	Habitats include Great Basin grassland, marsh & swamp, meadow & seep, valley & foothill grassland, and wetlands. This species is found in swamp lands, both fresh and salt, lowland meadows, and irrigated alfalfa fields. Tule (<i>Schoenoplectus acutus</i>) patches/tall grass are needed for nesting/daytime seclusion. Nests on dry ground in depression concealed in vegetation.	High Potential. Foraging Only During Winter. Known to Occur in Study Area. The species is seasonally present in the Project Area during the winter (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Western Burrowing Owl <i>Athene cunicularia</i>	BCC, SCC, S3	Habitat includes coastal prairie, coastal scrub, Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran desert scrub, and valley & foothill grassland. The species prefers open, dry annual or perennial grasslands, deserts, and scrublands characterized by low-growing vegetation. The species is a subterranean nester, dependent upon dens created by burrowing mammals, most notably the California Ground Squirrel (<i>Otospermophilus beecheyi</i>).	High Potential. Foraging Only During Winter. Species is known to winter in the Project vicinity and suitable habitat is present within the upland ruderal habitat and in the dunes in the Project Area (eBird 2019).
Canvasback <i>Aythya valisineria</i>	S2	Habitat includes Great Basin flowing waters, Great Basin standing waters, and wetlands. The species breeds in fresh, emergent wetlands bordering open water in northeastern California. They require emergent vegetation near suitable shallow-water foraging areas for nesting.	High Potential. Foraging Only. Known to Occur in Study Area. Species was observed in the Project Area during the winter of 1993 and wintering birds occur seasonally in the Project vicinity (eBird 2019). Suitable nesting habitat associated with emergent wetland vegetation in the Project Area.
American Bittern <i>Botaurus lentiginosus</i>	S3S4	Habitats include brackish marsh, freshwater marsh, and saltmarsh. The species favors freshwater and slightly brackish marshes and coastal saltmarshes. Microhabitat preferences include dense reed beds.	High Potential. Foraging and Nesting. Species has been known to occur in the Project vicinity (eBird 2019). Suitable nesting habitat associated with emergent wetland vegetation in less saline portions of the Project Area.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Marbled Murrelet <i>Brachyramphus marmoratus</i>	FT, SE, S1	Habitats include lower montane coniferous forest, old growth, and redwood. The species feeds near-shore and nests inland along the coast from Eureka to the Oregon border and from Half Moon Bay to Santa Cruz. They nest in old-growth redwood-dominated forests, up to 60 miles (96.5 kilometers) inland, often in Douglas-fir trees.	Low Potential. Fly-over Only. No suitable old growth coniferous forest habitat (for nesting) is present on or directly adjacent to the Project Area. However, the species likely flies over the Project Area on the way to foraging habitat (Humboldt Bay/the Pacific Ocean) (CDFW 2019a).
Black Brant <i>Branta bernicla</i>	SSC, S2	Habitat includes estuary, marine bay, and mud shore/flats. They require well-protected, shallow marine waters with intertidal eelgrass beds, primarily within bays and estuaries. At high tide they need sheltered open water or protected beaches for loafing. Their primary food is eelgrass. Distribution is closely tied to abundance of eelgrass. Brant often feed close to mudflats, sandbars or spits used as gritting sites.	High Potential. Foraging Only. Known to Occur in Study Area. Brant are known to occur during the winter and spring migration within the Project Area and seasonal presence is possible (eBird 2019).
Vaux's Swift <i>Chaetura vauxi</i>	SSC, S2S3	Habitats include lower montane coniferous forest, North Coast coniferous forest, mature forest, and redwood. The species prefers redwood, Douglas-fir, and other coniferous forests. They nest in large hollow trees and snags and often nest in flocks. They forage over most terrains and habitats but show a preference for foraging over rivers and lakes.	Moderate Potential. Foraging Only. There are numerous records of this species from the Project vicinity (eBird 2019). Foraging habitat is likely present in the Project Area. The presence of nests/colonies onsite is unknown but unlikely as there are no large trees or human made structures onsite.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Western Snowy Plover <i>Charadrius nivosus nivosus</i>	FT, BCC, SSC, S2S3	Habitat includes Great Basin standing waters, sandy shores, and wetlands. The species inhabits sandy beaches, and salt pond levees and shores of large alkali lakes. Plovers require sandy, gravelly or friable soils for nesting, and are often found in sparsely vegetated beaches in areas of ample sand.	High Potential. Foraging and Nesting. Known to Occur in Study Area. Western Snowy Plovers are known to use beaches in the Project Area year-round (nesting and wintering populations). Numerous nests have been documented within the dune restoration area on the upper waveslope, with most nesting attempts focused on the sparsely vegetated spit near the mouth of the Eel River in recent years (Colwell 2019, eBird 2019). The Project Area also includes designated critical habitat for this species (See Figure 3.4-5).
Northern Harrier <i>Circus hudsonius</i>	SSC, S3	Habitat includes coastal scrub, Great Basin grassland, marsh and swamp, riparian scrub, valley and foothill grassland, and wetlands. Species inhabits coastal salt & freshwater marsh. They nest and forage in grasslands, from saltgrass in desert sink to mountain cienagas (alkaline, wetland system unique to the southwest). The species nests on the ground in shrubby vegetation, usually at marsh edge; nests are built of a large mound of sticks in wet areas.	High Potential. Foraging and Nesting. Known to Occur in Study Area. There are records of this species from the Project Area year-round. Requisite foraging and nesting habitat (the shrubby edges of wet areas) is present at the Project Area (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Western Yellow-billed Cuckoo <i>Coccyzus americanus occidentalis</i>	FT, BCC, SE, S1	The species is a riparian forest nester, along the broad, lower flood-bottoms of larger river systems. They nest in dense riparian habitat of willow (<i>Salix spp.</i>), often mixed with black cottonwoods (<i>Populus balsamifera</i>), with an understory of blackberry (<i>Rubus spp.</i>), nettles (<i>Urtica dioica</i>), or California wild grape (<i>Vitis californica</i>).	Low Potential. Foraging and Nesting. Although suitable riparian habitat may be present for the species adjacent to the Project Area, there are no records of this species from the Project vicinity and the riparian habitat is considered marginal. The closest known recent records are from Cock Robin Island in the Eel River Wildlife Area and along the Salt River (CDFW 2019a, eBird 2019). Species presence is highly unlikely.
Olive-sided Flycatcher <i>Contopus cooperi</i>	BCC, SSC, S4	Habitats include lower montane coniferous forest, redwood, and upper montane coniferous forest. Nesting habitats are mixed conifer, montane hardwood-conifer, Douglas-fir, redwood, red fir (<i>Abies magnifica</i>), and lodgepole pine (<i>Pinus contorta</i>). The species is most numerous in montane conifer forests where tall trees overlook canyons, meadows, lakes or other open terrain.	High Potential. Foraging Only. Known to Occur in Study Area. Species is known to occur in the Project Area in low numbers (eBird 2019). The site may serve as foraging habitat for the species; breeding habitat unlikely as there are no trees in the Project Area.
Yellow Rail <i>Coturnicops noveboracensis</i>	BCC, SCC, S1S2	Habitats include freshwater marshes, meadows, and seeps. The species is a summer resident in the eastern Sierra Nevada in Mono County. Preferred microhabitat is freshwater marshlands.	No Potential. The only known record of this species from the North Coast (rare incidental) was from a domestic cat captured individual near the Blue Ox in Eureka (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Snowy Egret <i>Egretta thula</i>	S4	Habitat includes marsh and swamp, meadow and seep, riparian forest, riparian woodland, and wetlands. The species is a colonial nester, with nest sites situated in protected beds of dense tules. Rookery sites are situated close to foraging areas: marshes, tidal-flats, streams, wet meadows, and borders of lakes.	High Potential. Foraging Only. Known to Occur in Study Area. Species is known to occur in the Project Area year-round. The closest known rookery is at Hookton Slough.
White-tailed Kite <i>Elanus leucurus</i>	CFP, S3S4	Habitat includes cismontane woodland, marsh and swamp riparian woodland, valley and foothill grassland, and wetlands. The species inhabits rolling foothills and valley margins with scattered oaks & river bottomlands or marshes next to deciduous woodland. Microhabitat requirements include open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching.	High Potential. Foraging Only. Marsh or grassland areas exist in the Project Area that serve as foraging or nesting habitat (no trees occur onsite). Species common in the Project vicinity and likely to occur year-round in the Project Area (eBird 2019).
Little Willow Flycatcher <i>Empidonax traillii brewsteri</i>	BCC, SE, S1S2	Habitats include meadow, seeps, and riparian woodland. The species prefers mountain meadows and riparian habitats in the Sierra Nevada and Cascades. They nest near the edges of vegetation clumps and near streams.	High Potential. Fall Migration Only. Species is known to occur in the Ferndale Bottoms along the Salt River. This species is known to migrate south in early August to early October, and have very low numbers of adults along the riparian zones in coastal northern California (Rousseau and Ralph 2012). Coastal dune willow thicket shrubland alliance is present in the Project Area (Area E) which may provide suitable habitat for the species during migration.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Merlin <i>Falco columbarius</i>	CWL, S3S4	Habitat includes estuary, Great Basin grassland, and valley & foothill grassland. The species prefers the seacoast, tidal estuaries, open woodlands, savannahs, edges of grasslands and deserts, farms and ranches. Clumps of trees or windbreaks are required for roosting in open country.	High Potential. Foraging Only During Winter. Species is a common winter visitor to the Project vicinity and may forage within the Project Area (eBird 2019).
Prairie Falcon <i>Falco mexicanus</i>	BCC, CWL, S4	Habitats include Great Basin grassland, Great Basin scrub, Mojavean desert scrub, Sonoran Desert scrub, and valley and foothill grassland. The species favors dry, open terrain, either level or hilly. Breeding sites are located on cliffs. The species forages far afield, even to marshlands and ocean shores.	Low Potential. Fly-over or Foraging Only. Species is an uncommon winter visitor to the Project vicinity and may forage within the Project Area (eBird 2019).
American Peregrine Falcon <i>Falco peregrinus anatum</i>	BCC, CFP, S3S4	The species is found near wetlands, lakes, rivers, or other water; on cliffs, banks, dunes, mounds; or on human-made structures. Nests consist of a scrape or a depression or ledge in an open site.	High Potential. Foraging Only. Known to Occur in Study Area. Species has been observed in Project Area (M. van Hattem pers. comm. 2019) and is a common visitor to the Project vicinity (year-round presence, although greater numbers in the winter) (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Bald Eagle <i>Haliaeetus leucocephalus</i>	BCC, SE, CFP, S3	Habitat includes lower montane coniferous forest. The species inhabits ocean shore, lake margins, and rivers for both nesting and wintering. Most nests are within one mile (1.6 kilometers) of water. The species nests in large, or dominant live trees with open branches, especially ponderosa pine. Can roost communally in winter.	High Potential. Foraging Only. Known to Occur in Study Area. There are records of this species from the Project Area including individuals likely foraging nearshore along the coast (eBird 2019). In addition, coniferous forest habitat on Table Bluff could serve as nesting habitat for the species.
Long-billed Curlew <i>Numenius americanus</i>	BCC, CWL, S2	Habitats include Great Basin grassland, meadow, and seeps. The species breeds in upland shortgrass prairies and wet meadows in northeastern California. Habitats on gravelly soils and gently rolling terrain are favored over others.	High Potential. Foraging Only. Known to Occur in Study Area. Numerous records of this species exist from the Project Area (particularly during fall migration) (eBird 2019). Seasonal presence is possible
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	S4	Habitats include marsh and swamp, riparian forest, riparian woodland, and wetlands. The species is a colonial nester, usually in trees, occasionally in tule patches. Rookery sites are located adjacent to foraging areas: lake margins, mud-bordered bays, marshy spots.	High Potential for Foraging and Moderate Potential for Nesting. Known to Occur in Study Area. There are numerous records of this species from the Project Area. Requisite foraging habitat is present, and nesting habitat (utilizing tule patches) may be present in the Project Area. No trees or rookeries exist within the Project Area. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Osprey <i>Pandion haliaetus</i>	CWL, S4	Habitats include ocean shore, bays, freshwater lakes, and larger streams. Large nests are built in tree-tops within 15 miles (24 hectares) of foraging habitat.	High Potential. Fly-over or Foraging Only. Known to Occur in Study Area. There are records of this species from the Project Area including individuals likely foraging nearshore along the coast (eBird 2019). In addition, patches of coniferous forest adjacent to the Project Area could serve as nesting habitat for this species.
Bryant's Savannah Sparrow <i>Passerculus sandwichensis alaudinus</i>	SSC, S2S3	Habitats include low tidally influenced habitats, adjacent ruderal areas, moist grasslands within and just above the fog belt, and, infrequently, drier grasslands (Fitton 2008). This species occurs year-round in coastal California and was observed to prefer ungrazed versus grazed sites for foraging and nesting near Humboldt Bay (Kwasny 2000 in Fitton 2008).	High Potential. Foraging and Nesting. Known to Occur in Study Area. Bryant's Savannah Sparrow is a resident breeder within the Project Area (M. van Hattem, pers. comm. 2019). The species (Savannah Sparrow) has been documented numerous times throughout the Project Area (eBird 2020). Suitable nesting habitat in tidal areas (associated with clumps of grass or pickleweed).
California Brown Pelican <i>Pelecanus occidentalis californicus</i>	CFP, S3	The species is a colonial nester on coastal islands just outside the surf line. They nest on coastal islands of small to moderate size which afford immunity from attack by ground-dwelling predators. The species roosts communally.	Low Potential, Winter Foraging. Fly-over Only. This species is occasionally observed in nearshore waters off the north and south spits (primarily during the winter) (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Double-crested Cormorant <i>Phalacrocorax auritus</i>	CWL, S4	The species is a colonial nester on coastal cliffs, offshore islands, and along lake margins in the interior of the State. They nest along the coast on sequestered islets, usually on ground with sloping surface, or in tall trees along lake margins.	High Potential. Likely Foraging, Possibly Nesting. The Project Area contains suitable foraging and marginal nesting habitat. Species may also fly over the Project Area to access additional foraging habitat (Pacific Ocean).
Purple Martin <i>Progne subis</i>	SSC, S3	Habitats include broadleaved upland forest and lower montane coniferous forest. The species prefers woodlands, low elevation coniferous forest of Douglas-fir, ponderosa pine, and Monterey pine (<i>Pinus radiata</i>). The species primarily nests in old woodpecker cavities; also in human-made structures. Nests are often located in tall, isolated trees/snags.	High Potential. Foraging Only. Known to Occur in Study Area. There are several occurrences of this species from the Project Area and the species may forage onsite. Nesting substrate is limited, as there are no trees or human-made structures within the Project Area.
California Ridgway's Rail <i>Rallus obsoletus obsoletus</i>	FE, SE, CFP, S1	Habitats include brackish marsh, marsh & swamp, saltmarsh, and wetland. The species inhabits salt water and brackish marshes traversed by tidal sloughs in the vicinity of San Francisco Bay. They are associated with abundant growths of pickleweed, but feed on invertebrates from mud-bottomed sloughs away from cover.	No Potential. The last Ridgway's Rail breeding population documented in Humboldt County was in 1932 at the mouth of the Mad River (CDFW 2019a). No records of the species have been documented since then. The species was extirpated from this area most likely as the result of tidal marsh habitat loss.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Bank Swallow <i>Riparia riparia</i>	ST, S2	Habitats include riparian scrub and riparian woodland. The species is a colonial nester. Nests primarily in riparian and other lowland habitats west of the desert. They require vertical banks/cliffs with fine-textured/sandy soils near streams, rivers, lakes, and/or the ocean bluffs to dig nest tunnels and burrows.	Moderate Potential. Foraging Only. There are no available muddy banks/cliffs present for nesting habitat in the Project Area, however this species is known to nest in the lower Eel River outside of the Project Area (M. van Hattem, pers. comm. 2019). There are also species records from the Project vicinity and the species may forage in the Project Area (eBird 2019).
Rufous Hummingbird <i>Selasphorus rufus</i>	BCC, S1S2	Habitats include North Coast coniferous forest and old growth. The species breeds in the northwest coastal area from the Oregon border to southern Sonoma County. They nest in berry tangles, shrubs, and conifers. Favors habitats rich in nectar-producing flowers.	High Potential. Foraging Only. Known to Occur in Study Area. There are records of this species from the Project Area and suitable foraging habitat may be present onsite (eBird 2019).
Yellow Warbler <i>Setophaga petechia</i>	BCC, SSC, S3S4	Habitats include riparian forest, riparian scrub, and riparian woodland. The species prefers riparian plant associations in close proximity to water. The species also nests in montane shrub habitat in open conifer forests in the Cascades and Sierra Nevada. The species commonly nests and forages in willow shrubs and thickets, and in other riparian plants including black cottonwood, sycamore (<i>Platanus spp.</i>), ash (<i>Fraxinus spp.</i>), and red alder (<i>Alnus rubra</i>).	High Potential. Foraging and Nesting. Known to Occur in Study Area. There are several occurrences of this species from the Project Area, and suitable nesting habitat may be present onsite in the coastal dune willow thicket shrubland alliance (eBird 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Northern Spotted Owl <i>Strix occidentalis caurina</i>	FT, ST, S2S3	Habitat includes North Coast coniferous forest, old growth redwood. The species inhabits old-growth forests or mixed stands of old growth and mature trees. They are occasionally found in younger forests within patches of big trees. Preferred microhabitat includes a high, multistory canopy dominated by big trees, many trees with cavities or broken tops, downed wood, and space under canopy.	No Potential. No suitable old growth coniferous forest habitat (for foraging or nesting) is present on or directly adjacent to the Project Area.
FISH			
Green Sturgeon - Northern DPS <i>Acipenser medirostris</i>	SSC, S1S2, AFS-VU	These are the most marine species of sturgeon; they feed in coastal marine and estuarine environments and adults return to selected large rivers to spawn. Ocean abundance increases northward of Point Conception. The Northern DPS is known to spawn in the Rogue and Klamath Rivers at temperatures between 8-14°C. Recent research indicates that a spawning run still occurs in the Eel River basin that appears to be of Northern DPS decent (Stillwater Sciences and Wiyot Tribe 2017). The Southern DPS, which was Federally-listed as threatened in 2006 (NMFS 2006), only spawns in the Sacramento River; however, listed Southern DPS green sturgeon may enter the Eel River estuary to feed (Lindley et al. 2011). Prefers spawning substrate of large cobble but can range from clean sand to bedrock.	Moderate Potential. Repeated observations of small numbers of adult and juvenile green sturgeon in the Eel River since 2002 suggest spawning may have resumed there after decades of spawning absence (Higgins 2013, CDFW 2015, Stillwater Sciences and Wiyot Tribe 2017). This species may utilize McNulty Slough.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Pacific Lamprey <i>Entosphenus tridentatus</i>	SSC, S4, AFS-VU	Anadromous species that is distributed along the west coast of North America from central Baja California to the Bering Sea off Alaska, as well as off the coast of Japan. Widely distributed throughout the Eel River Basin, although population numbers have declined substantially (Stillwater Sciences 2010). Microhabitat preferences include streams with swift-current gravel-bottomed areas for spawning with water temps between 12-18° C (Stillwater Sciences and Wiyot Tribe 2016). Ammocoetes need soft sand or mud.	Moderate Potential. No spawning habitat (freshwater gravel bottomed streams or riffle habitat) occur within the Project Area. However, juvenile and adult lamprey may exist within the tidal channels. This species has been documented migrating into the Eel River in the winter and spring, and it is hypothesized that an alternative migration in the summer and early fall may also be taking place (Stillwater Sciences and Wiyot Tribe 2016). Juvenile outmigration to the ocean typically occurs in the winter and spring during high flow events (CDFW 2015).
Tidewater Goby <i>Eucyclogobius newberryi</i>	FE, SSC, S3, AFS- EN	Brackish water habitats along the California coast from Agua Hedionda Lagoon, San Diego County to the lower Smith River. Found in shallow lagoons and lower stream reaches, they need fairly still but not stagnant water and high oxygen levels (CDFW 2019a). The species is typically found in water less than one meter deep and salinities of less than 12 parts per thousand (USFWS 2005).	High Potential. Known to Occur in Study Area. This species has been documented within shallow low-velocity brackish water habitat in the Project Area (Scheiff and Gilroy 2013, Ray 2018b). Designated critical habitat for Tidewater Goby is located in a slough channel approximately 0.5 mile (0.8 kilometer) east of the Project Area and within the Eel River estuary.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Coastal Cutthroat Trout <i>Oncorhynchus clarkii clarkii</i>	SSC, S3, AFS-VU	Small, low gradient, coastal streams and estuarine habitats including lagoons (CDFW 2015) from the Eel River to the Oregon border (CDFW 2019a). Need shaded streams with optimal water temperatures less than 18° C, small gravel for spawning and deep pools for holding in summer (CDFW 2015, CDFW 2019a).	High Potential. This species has been documented in the Eel River estuary as well as lower Eel River tributaries such as the Salt River (CDFW 2015, CDFW 2019a). It is presumed present in the Project Area.
Coho Salmon - Southern Oregon / Northern California Coast Evolutionarily Significant Unit (ESU) <i>Oncorhynchus kisutch</i>	FT, ST, S2 AFS-TH	Anadromous fish, spending the first portion of its life cycle in small coastal streams and estuaries before outmigrating to the ocean. After approximately 6 to 18 months in the ocean, the species returns to its natal stream to spawn (CalTrout 2019). Coho Salmon in northern California are typically associated with low gradient reaches of tributary streams to larger river systems (CDFW 2019b) and spawn in coastal rivers and creeks typically at age three (CalTrout 2019).	High Potential. Known to Occur in Study Area. This species has been documented in tidal portions of the Project Area, and records of this species exist from the adjacent McNulty Slough (Cannata and Hassler 1995, Scheiff et al. 2013). Young of the year Coho Salmon are not expected to utilize habitat in the Project Area in late spring and summer because salinities are too high and water temperatures are not suitable (they are greater than 17°C) (Wallace and Gilroy 2008). Critical habitat for Coho Salmon is designated in McNulty Slough.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Steelhead Trout- Northern California DPS <i>Oncorhynchus mykiss</i>	FT, S2S3, AFS-TH	Anadromous fish, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. The federal designation refers to 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. Known to Occur in Study Area. The species is present in tidal portions of the Project Area, and records of this species exist from the adjacent McNulty Slough (Cannata and Hassler 1995, Scheiff et al. 2013). Water quality conditions within McNulty Slough appear to be acceptable for outmigrating Steelhead Trout (Wallace and Gilroy 2008). Critical habitat for Steelhead Trout is designated in the Eel River estuary.
Chinook Salmon - California Coastal ESU <i>Oncorhynchus tshawytscha</i>	FT, S1, AFS-TH	Anadromous fish, spending most of its life cycle in the ocean, but spawning in coastal rivers and creeks. Juveniles resulting from the fall adult run outmigrate in the spring. The Coastal Chinook Salmon ESU includes naturally spawned populations from rivers and streams south of the Klamath River (exclusive) to the Russian River (inclusive) (CDFW 2019a).	High Potential. Known to Occur in Study Area. This species has been documented in the Project Area (Ray 2018b) and is expected to be present during spring outmigration (March through June) and likely until September. Water quality conditions within McNulty Slough appear to be acceptable for outmigrating juvenile Chinook Salmon (Wallace and Gilroy 2008). Critical habitat for this species is designated in McNulty Slough.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Longfin Smelt <i>Spirinchus thaleichthys</i>	ST, S1	Euryhaline (able to adapt to a wide range of salinities), nektonic (part of an aggregate of swimming aquatic organisms), and anadromous. Occupies nearshore waters, estuaries, and lower portions of freshwater streams (Garwood 2018). Found in open waters of estuaries, mostly in middle or bottom of water column. Prefer salinities of 15-30 parts per thousand (ppt). Known to spawn in both the Eel River and in tributaries to Humboldt Bay.	High Potential. The species has been documented in McNulty Slough (Scheiff et. al. 2013).
Eulachon – Southern DPS <i>Thaleichthys pacificus</i>	FT, S3	Found in Klamath River, Mad River, Redwood Creek and in small numbers in Smith River and Humboldt Bay tributaries. Spawn in lower reaches of coastal rivers w/ moderate water velocities and bottom of pea-sized gravel, sand and woody debris.	Low Potential. Undetected from recent nearby samples. Potentially suitable habitat is present.
REPTILES			
Green Sea Turtle <i>Chelonia mydas</i>	FT	Habitat includes marine and bay areas. The species is completely herbivorous; needs adequate supply of seagrasses and algae.	Low Potential. No marine habitat is present in the Project Area (although there is ocean-fronting beach) and there are no known records of this species from the beaches in the Project Area (CDFW 2019a, iNaturalist 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Northwestern Pond Turtle <i>Emys marmorata marmorata</i>	SSC, S3	This species is found throughout California in streams, wetlands, ponds and lakes below 6000 feet (1,829 meters). The species needs basking sites and suitable (sandy banks or grassy open fields) upland habitat up to 0.5 kilometers from water for egg-laying.	Moderate Potential. There is one recent (2017) record of this species from the Project vicinity. Limited freshwater habitat occurs in the northern portion of Area E in the Project Area (CDFW 2019a). If present, likely limited to the freshwater habitats around northern end of Area E.
Olive Ridley Sea Turtle <i>Lepidochelys olivacea</i>	FT	Preferred nesting areas occur along continental margins and rarely, on oceanic islands. In the eastern Pacific, the largest nesting concentrations occur in southern Mexico and northern Costa Rica (NMFS and USFWS 1998). This species is believed to migrate between breeding grounds in the north and feeding grounds to the south, in the eastern Pacific (NMFS and USFWS 1998). This species is primarily vegetarian but does eat benthic prey such as crustaceans (NMFS and USFWS 1998).	Low Potential. No marine habitat is present in the Project Area (although there is ocean-fronting beach) and there are no known records of this species from the beaches in the Project Area (CDFW 2019a, iNaturalist 2019).
AMPHIBIANS			
Coastal Tailed Frog <i>Ascaphus truei</i>	SSC	Habitat includes aquatic, Klamath/North Coast flowing waters, lower montane coniferous forest, North Coast coniferous forest, redwood, and riparian forest. The species occurs in montane hardwood-conifer, redwood, Douglas-fir & ponderosa pine habitats. The species is restricted to perennial montane streams. Tadpoles require water below 15° C.	No Potential. Requisite habitat for this species is not present in or directly adjacent to the Project Area, and there are no known records of this species from the Project Area (CDFW 2019a, iNaturalist 2019).

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Northern Red-legged Frog <i>Rana aurora</i>	SSC, S3	Habitat includes Klamath/North Coast flowing waters, riparian forest, and riparian woodland. The species inhabits humid forests, woodlands, grasslands, and streamsides in northwestern California, usually near dense riparian cover. The species is generally near permanent water, but can be found far from water, in damp woods and meadows, during the non-breeding season.	High Potential. Known to Occur in Study Area. Requisite habitat (coastal wetlands and riparian habitat,) for this species is present in the northern extent of Areas C and E within the Project Area. There are numerous records of this species from the Project Area (CDFW 2019a, iNaturalist 2019).
Foothill Yellow-legged Frog <i>Rana boylei</i>	SSC, S3S4	Habitat includes aquatic, chaparral, cismontane woodland, coastal scrub, Klamath/North Coast streams, lower montane coniferous forest, meadow & seep, riparian forest, and riparian woodland. The species prefers partly-shaded, shallow streams and riffles with a rocky substrate in a variety of habitats and needs at least some cobble-sized substrate for egg-laying. Also, this species needs at least 15 weeks to reach metamorphosis.	Low Potential. Requisite habitat for this species is not present on or directly adjacent to the Project Area, and there are no known records of this species from the Project Area (CDFW 2019a, iNaturalist 2019).
INVERTEBRATES			
California Floater <i>Anodonta californiensis</i>	S2	This species inhabits freshwater lakes and slow-moving streams and rivers, and generally occurs in shallow water.	No Potential. No freshwater aquatic/riverine habitat occurs within the Project Area. Freshwater pond in Area A is very small (0.2 acre) and contains some tidal influence via seepage.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Obscure Bumble Bee <i>Bombus caliginosus</i>	S1S2	This species inhabits coastal areas from Santa Barbara county north to Washington state. Associated food plants include <i>Baccharis spp.</i> , <i>Cirsium spp.</i> , <i>Lupinus spp.</i> , <i>Lotus spp.</i> , <i>Grindelia spp.</i> and <i>Phacelia spp.</i>	Moderate Potential. The Project Area falls within the species current range (Hatfield et al. 2014). CNDDDB data, shows the four closest detections to the Project Area of this species were all 40-60 years ago. These include one within five miles of the Project Area, two within 6-10 miles from the Project Area, and one detection 11-15 miles from the Project Area.
Western Bumble Bee <i>Bombus occidentalis</i>	SC,S1	Once common and widespread, species has declined precipitously from central California to southern British Columbia, perhaps from disease.	Low Potential. Although the Project Area falls within the species pre-2002 range (according to ICUN Redlist), the range has contracted significantly in the last decade and now only includes the intermountain west and cascade regions of the U.S. (Hatfield et al. 2015). CNDDDB data, shows the three closest detections to the Project Area of this species include one detection within five miles, but over 80 years old, and two occurrences within 6-10 miles that are 40-60 years old.

Species	Status ¹	Habitat Requirements ²	Potential to Occur On-site
Sandy Beach Tiger Beetle <i>Cicindela hirticollis gravida</i>	S2	The species inhabits coastal dunes adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico. Microhabitat preferences include clean, dry, light-colored sand in the upper zone. Subterranean larvae prefer moist sand not affected by wave action.	No Potential. Last historical record of this species from Humboldt County was in the early 1900s (CDFW 2019a). This species is believed to have been extirpated from the area with known extant populations only in Marin, San Luis Obispo, Ventura, Santa Barbara, and San Diego counties in California (NatureServe 2019).
Western Pearlshell <i>Margaritifera falcata</i>	S1S2	The species inhabits freshwater streams usually associated with velocity breaks (e.g., bedrock or large wood).	No Potential. No riverine habitat occurs within the Project Area.

Key to status codes:

FE = Federal Endangered

FT = Federal Threatened

FC = Federal Candidate

FD = Federal Delisted

PT = Proposed Threatened

BCC = USFWS Birds of Conservation Concern

SE = State Endangered

SC = State Candidate

SD = State Delisted

SNR= State Not Ranked

ST = State Threatened

MMPA Protection = Marine Mammal Protection Act Protection

SR = State Rare

SSC = CDFW Species of Special Concern

CFP = CDFW Fully Protected Animal

CWL = CDFW Watch List

BCC = USFWS Birds of Conservation Concern

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)

WBWG = Western Bat Working Group

WBWG = Western Bat Working Group (independent group composed of agencies, organizations and individuals interested in bat research, management and conservation).

- WBWG High Priority: represents species considered highest priority for funding, planning, and conservation actions. These species are imperiled or at high risk of imperilment.
- WBWG Medium Priority: indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats (including lack of meaningful information).
- WBWG Low Priority: indicates that most of the existing data support stable populations of the species, and that the potential for major changes in status in the near future is considered unlikely.

AFS = American Fisheries Society; EN = Endangered, TH = Threatened, VU = Vulnerable

SR = State Rare

SSC = CDFW Species of Special Concern

CFP = CDFW Fully Protected Animal

CWL = CDFW Watch List

CDFW Special Animal List State Ranking:

S1: Critically Imperiled

S2: Imperiled

S3: Vulnerable

S4: Apparently Secure

S5: Secure

Potential to Occur:

No Potential Habitat on and adjacent to the Project Area is clearly unsuitable for the species requirements (e.g., 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 Project Area is unsuitable or of very poor quality. The species is not likely to be found in the Project Area.

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

High Potential All of the habitat components meeting the species requirements are present and/or most of the habitat on or adjacent to the Project Area is highly suitable for one or more components of their life cycle. The species has a high probability of being found in the Project Area, or has been observed in the Project Area

Table compiled from CDFW California Natural Diversity Database (CNDDDB), U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) Species List, and the National Marine Fisheries Service (NMFS) West Coast Fisheries Database Electronic Inventory searches of the Cannibal Island, Ferndale, Fortuna, Eureka, and Field's Landing USGS 7.5 Minute Quadrangles (CDFW 2019a, CNPS 2019, NMFS 2019, USFWS 2019). 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, eBird and iNaturalist citizen science databases, CDFG frog survey 2010, CDFW fish sampling data (2006-2009, 2012, 2017, 2018), and incidental observations made during site visits by GHD and HTH (Colwell 2019, eBird 2019, iNaturalist 2019).

3.4.2 Regulatory Framework

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

Federal Regulations

Clean Water Act, Section 404

The CWA (1977, as amended) establishes the basic structure for regulating discharges of pollutants into Waters of the U.S. It gives the U.S. Environmental Protection Agency (EPA) the authority to implement pollution control programs, including setting wastewater standards for industry and water quality standards for contaminants in surface waters. The CWA makes it unlawful for any person to discharge any pollutant from a point source into Waters of the U.S., without a permit under its provisions.

Proposed discharges of dredged or fill material into Waters of the U.S. require USACE authorization under Section 404 of the CWA [33 U.S.C. 1344]. Regulations implementing CWA Section 404 define “Waters of the U.S.” to include intrastate waters (such as, lakes, rivers, streams, wetlands, and natural ponds) that the use, degradation, or destruction of could affect interstate or foreign commerce. Wetlands are defined for regulatory purposes as “areas that are inundated or saturated by surface or groundwater 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 Code of Federal Regulations [CFR] 328.3; 40 CFR 230.3). Projects are reviewed by USACE under standard (i.e., individual) or general (i.e., nationwide, programmatic, or regional) permits. The type of permit process used to consider a project is determined by the USACE and based on project parameters.

Clean Water Act, Section 401

In California, the State Water Resources Control Board (SWRCB) and nine RWQCBs review projects for compliance with state and federal water quality standards under Section 401 of the CWA. In Humboldt County, the NCRWQCB is responsible for certifying that a federally permitted project meets state water quality objectives (§401 CWA, and Title 23 California Code of Regulations [CCR] 3830, et seq.) before the permit is issued.

Executive Order 11990

Executive Order 11990 (1977) requires all federal agencies managing federal lands, sponsoring federal projects, or funding state or local projects to assess the effects of their actions on wetlands. The agencies are required to follow avoidance, mitigation, and preservation procedures, where practicable. The Presidential Wetland Policy of 1993 and subsequent reaffirmation of the policy in 1995 supports protection and restoration of wetlands, while advocating for increased fairness of federal regulatory programs.

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.

Federal Endangered Species Act

The Endangered Species Act (ESA) of 1973 (16 USC 1531 *et seq.*) establishes a national policy that all federal departments and agencies provide for the conservation of threatened and endangered species and their habitats. The Secretary of the Interior and the Secretary of Commerce are designated in the ESA as responsible for: (1) maintaining a list of species likely to become endangered within the foreseeable future throughout all or a significant portion of its range (threatened) and that are currently in danger of extinction throughout all or a significant portion of its range (endangered); (2) carrying out programs for the conservation of these species; and (3) rendering opinions regarding the impact of proposed federal actions on listed species. The ESA also outlines what constitutes unlawful taking, importation, sale, and possession of listed species and specifies civil and criminal penalties for unlawful activities.

Pursuant to the requirements of the ESA, an agency reviewing a project within its jurisdiction must determine whether any Federally listed or proposed species may be present in the project region, and whether the proposed project would result in “take” of such species. The ESA prohibits “take” of threatened and endangered fish or wildlife species except under certain circumstances and only with authorization from USFWS or NMFS through a permit process. “Take” under the ESA includes activities such as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” USFWS regulations define harm to include “significant habitat modification or degradation.” On June 29, 1995, a U.S. Supreme Court ruling further defined harm to include habitat modification “...where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering.” Of note, Federally-listed plants are not protected from take, although it is illegal to collect or maliciously harm them on federal land.

In addition, an agency reviewing a project is required to determine whether the project is likely to jeopardize the continued existence of any species proposed to be listed under the ESA or result in the destruction or adverse modification of critical habitat for such species (16 USC 1536[3][4]). Critical Habitat is defined by the ESA as a specific geographic area containing features essential for the conservation of an endangered or threatened species. Critical habitat should be evaluated if designated for Federally listed species that may be present in the project vicinity and/or potentially impacted by the project.

Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) (16 U.S.C. 1362) of 1972 prohibits the “taking” of marine mammals and restricts the import, export, or sale of marine

mammals. Take under the MMPA is defined as “the act of hunting, killing, capture, and/or harassment of any marine mammal; or, the attempt at such.” Harassment includes disruption of behavioral patterns. Implementation of the MMPA is divided between USFWS (sea otters [*Enhydra lutris*], walruses [*Odobenus rosmarus*], polar bears [*Ursus maritimus*], manatees [*Trichechus manatus*], and dugongs [*Dugong dugon*]) and NMFS (pinnipeds including seals and sea lions and cetaceans including dolphins and whales). Incidental Harassment Authorizations (IHA) or Letters of Authorization (LOA) may be issued for certain activities which can result in small amounts of take incidental to another lawful activity.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) was passed in 1972 and established a national policy and national program for the management, beneficial use, protection, and development of land and water resources of the nation’s coastal zones. The voluntary national program was meant to encourage coastal states to develop and implement coastal zone management plans. The Coastal Act (further described below) is the foundation of the California Coastal Management Program which is California’s coastal zone management plan. The CZMA requires that federal actions and development requiring federal permits or funding affecting land or water areas or resources within the coastal zone are consistent with the provisions of the act and approved coastal zone management plans. In California, outside of San Francisco Bay, the California Coastal Management Program is implemented and enforced by the CCC.

Magnuson-Stevens Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) was passed in 1976 and provides the federal government with the authority to manage fisheries in the U.S. Exclusive Economic Zone (EEZ) (from state waters which end 3 nautical miles offshore to a distance of 200 nautical miles). In addition, the MSA mandates inter-agency cooperation in achieving protection, conservation, and enhancement of Essential Fish Habitat (EFH). The MSA defines EFH as “Those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity, and may include migratory routes, open waters, wetlands, estuarine habitats, artificial reefs, shipwrecks, mangroves, mussel beds, and coral reefs.” For the purpose of interpreting the definition of EFH: ‘Waters’ include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; ‘substrate’ includes sediment, hard bottom, structures underlying the waters, and associated biological communities; ‘necessary’ means the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and “spawning, breeding, feeding, or growth to maturity” covers a species’ full life cycle” (50 CFR 600.10). EFH designations serve to highlight the importance of habitat conservation for sustainable fisheries and sustaining valuable fish populations. EFH relates directly to the physical fish habitat and indirectly to factors that contribute to degradation of this habitat. Important components of EFH include adequate water quality, temperature, food source, water depth, and cover/vegetation.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-711) as amended 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. The MBTA prohibits the take, possession, buying, selling, purchasing, or bartering of any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21). Only exotic species such as Rock Pigeons (*Columba livia*), House Sparrows (*Passer domesticus*), and European Starlings (*Sturnus vulgaris*) are exempt from protection.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) was originally enacted in 1940 in order to protect the national emblem of the United States, the Bald Eagle. At that time, the Bald Eagle was experiencing significant population pressures from hunting, egg collection, and habitat loss (Buehler 2000). This act was expanded in 1962 to include protections for the Golden Eagle (*Aquila chrysaetos*), which was also experiencing precipitous population declines due to habitat loss, hunting, and electrocution from power lines (Kochert et al. 2002).

The current federal statute as amended (16 U.S.C. 668-668d) includes criminal penalties for anyone, including individuals, associations, partnerships, and corporations who “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof” without a permit (16 U.S.C. § 668a).

A BGEPA take permit may be required if a proposed activity is near an active or inactive eagle nest, roosting site, or foraging site. This is particularly true if the project is near breeding habitat (as opposed to wintering habitat or migratory stop-over sites). The act applies to all activities that may impact eagles, including projects without a federal nexus. If there is a possibility that the project could “non-purposefully take” eagles (unavoidable take associated with, but not the purpose of an activity) the USFWS may issue a programmatic take permit. In this case, the permit would be subject to conditions or mitigation measures to minimize impacts. Post-construction monitoring and annual reports may also be required (50 CFR 22.26).

State Regulations

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 14 California Administrative Code (CAC) 670.2 or 670.5, or 50 CFR 17.11 or 17.12 pursuant to the ESA as threatened or endangered.

California Coastal Act

The Coastal Act (California Public Resources Code [PRC] Sections 30000 et seq) was enacted by the State Legislature in 1976 to provide long-term protection of California's 1,100-mile (1,770 kilometers) coastline for the benefit of current and future generations. Coastal Act policies constitute the standards used by the CCC in its coastal development permit decisions and for the review of local coastal programs (LCPs) prepared by local governments and submitted to the CCC for approval. These policies are also used by the CCC to review federal activities that affect the coastal zone (see Coastal Zone Management Act above). 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;

The Coastal Act defines an “environmentally sensitive habitat area” (ESHA) as an “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” (Section 30107.5). Three important elements define an ESHA:

1. A geographic area can be designated ESHA because of the presence of individual species of plants or animals or because of the presence of a particular habitat;
2. In order for an area to be designated as ESHA, the species or habitat must be either rare or it must be especially valuable; and,
3. The area must be easily disturbed or degraded by human activities.

Section 30240 states in part that:

- a) ESHA shall be protected against significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.
- b) Development in areas adjacent to ESHA and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas and shall be compatible with the continuance of those habitat and recreation areas.

While there is not a specific list of habitats considered to be ESHA for the state or county, the CCC through the Coastal Act and counties or municipalities through LCPs are the jurisdictional agencies that exert authority in identifying and protecting ESHA during project review and permitting. The CCC generally considers CDFW-designated Sensitive Natural Communities to be ESHAs. Thus the Sensitive Natural Communities discussed in Impact BIO-2 would also likely be considered ESHA under the Coastal Act.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter Cologne) was passed in 1969 and assigns overall authority for water rights and water quality protection to the SWRCB and directs the nine RWQCBs to develop and enforce water quality standards within their boundaries. Through Porter-Cologne, the RWQCBs are responsible for regulating any activity, including waste discharges, that would, or that have the potential to, impair the beneficial uses of water bodies.

The SWRCB utilizes WDRs to regulate activities that may affect waters of the state or that may discharge water in a diffuse matter. As described above, any federally sponsored or permitted activity that may result in a discharge to a water body must be certified under CWA Section 401 that the proposed activity would comply with state water quality standards. In practice, a CWA Section 401 Water Quality Certification incorporates a “General Waste Discharge Requirement for Dredge and Fill Discharges”, so a project-specific WDR is not typically required. A WDR is, however, required when a CWA Section 401 Water Quality Certification is not, or if the project is particularly complex.

In the Project Area, the NCRWQCB regulates construction in Waters of the U.S. and Waters of the State, including activities in wetlands, under both the CWA and Porter Cologne (California Water Code, Division 7).

Executive Order W-59-93, State Wetland Conservation Policy

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.

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, threatened, or designated as candidates for such listing (California Fish and Game Code (FGC) Sections 2050 through 2085). The CESA generally parallels the main provisions of the ESA and is administered by CDFW, which maintains a list of state threatened and endangered species as well as candidate species. The CESA 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 CCR 670.2 and 14 CCR 670.5, respectively. The state prohibits the incidental take of species listed pursuant to CESA or candidate species unless that take is permitted by CDFW. Under CESA, “take” is defined as to “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” It does not include protection of habitat, unless alteration or removal of habitat would result in direct “take” (as defined above) of an individual animal.

California Fish and Game Code

CDFW is responsible for conserving, protecting, and managing California’s fish, wildlife, and native plant resources. To meet this responsibility, FGC Section 1602

et. seq. requires an entity to notify CDFW of any proposed activity that would substantially alter the bed, bank, or channel of a lake or stream, would substantially divert or obstruct the flow of water, or that would use material from the streambed. A Lake or Streambed Alteration Agreement (LSAA) would include avoidance and minimization measures necessary to protect those resources. CDFW would issue an LSAA for the proposed Project prior to implementing stream alteration work.

Species of Special Concern

The CDFW maintains a list of Species of Special Concern. A Species of Special Concern is a species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:

- is extirpated from the state or, in the case of birds, is extirpated in its primary season or breeding role;
- is listed as Federally-, but not State-, threatened or endangered; meets the state definition of threatened or endangered but has not formally been listed;
- is experiencing, or formerly experienced, serious (nonscyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status; or
- has naturally small populations exhibiting high susceptibility to risk from any factor(s), that if realized, could lead to declines that would qualify it for state threatened or endangered status.

Species of Special Concern, are species that are declining in California, and if current population and habitat trends continue could warrant listing pursuant to CESA or the ESA. Species of Special Concern receive consideration under CEQA.

Native Plant Protection Act

The CDFW administers the California Native Plant Protection Act (CNPPA) (FGC Sections 1900–1913). The CNPPA allows 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 FGC 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.”

Sensitive Natural Communities

The Manual of California Vegetation Online, describes California vegetation types, also known as “natural communities,” and categorizes them into a hierarchical structure of alliances and associations. CDFW’s CNDDDB evaluates the rarity and threats to these natural communities and ranks them into set categories, known as a state ranking. Alliances and associations with a CNDDDB State (“S”) ranking of S1 through S3 are defined as Sensitive Natural Communities and impacts to them should be assessed during CEQA project review. State ranking includes the following:

- S1 = Critically Imperiled – Critically imperiled in the state because of extreme rarity (often five or fewer occurrences) or because of some factor(s) such as very steep declines making it especially vulnerable to extirpation from the state.
- S2 = Imperiled – Imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state.
- S3 = Vulnerable – Vulnerable in the state due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.
- S4 = Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
- S5 = Secure – Common, widespread, and abundant in the state.

Eelgrass Mitigation Policy

Eelgrass habitat is protected under a variety of state and federal laws because of the important biological, physical, and economic values it provides. To avoid further loss of existing eelgrass habitat, the West Coast NOAA's Region of NMFS released the California Eelgrass Mitigation Policy and Implementing Guidelines (NMFS 2014a) to provide guidance on eelgrass mitigation efforts. It is an expansion of an earlier policy from southern California implemented in 1991, which led to 2011 recommendations for an integrated eelgrass monitoring and assessment program for the southern California coast.

California Invasive Plant Council

The California Invasive Plant Council (Cal-IPC) keeps an inventory categorizing plants that threaten California's natural areas. The inventory includes invasive plants that currently cause environmental damage or economic harm in California as well as a "Watch List" of plants that are a high risk of becoming invasive in the future. The inventory represents the best available knowledge of invasive plant experts in California. Categorization is based on an assessment of ecological impacts, conducted with transparent science-based criteria and expert review. The inventory has no regulatory authority, rather is intended to be utilized as a management resource. The categorization or ratings of Cal-IPC plants are in accordance with the following:

- **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically. European beachgrass and dense-flowered cordgrass are Cal-IPC rated as High.
- **Moderate** – These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

- **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.
- **Alert** – An Alert is listed on species with High or Moderate impacts that have limited distribution in California but may have the potential to spread much further.
- **Watch** – These species have been assessed as posing a high risk of becoming invasive in the future in California

Public Trust Lands

The State Lands Commission (SLC) has jurisdiction and management authority over all public trust lands, including ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine which requires they be managed for the benefit of the public consistent with the provisions of Public trust (e.g., commerce, navigation, fisheries, recreation). Review by the SLC and issuance of a new, or amendment of an existing surface lease may be required for a project under SLC jurisdiction.

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the SLC, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Potential impacts within each resource category extending beyond the Project Area boundary, such as potential impacts to the biological resources within portions of lower Hawk and Sevenmile sloughs, and the entirety of North Bay are analyzed utilizing local regulatory documents such as the Humboldt County General Plan and the Local Coastal Program Eel River Area Plan. Therefore local and regional regulatory policies are discussed below.

Humboldt County General Plan

The following policies from the Humboldt County General Plan are applicable to the portions of the study area located outside of the Project Area with regard to biological resources (Humboldt County 2017):

BR-P1. Compatible Land Uses

Area containing sensitive habitats shall be planned and zoned for uses compatible with the long-term sustainability of the habitat. Discretionary land uses and building activity in proximity to sensitive habitats shall be conditioned or otherwise permitted to prevent significant degradation of sensitive habitat, to the extent feasible, consistent with CDFW guidelines or recovery strategies.

BR-P2. Critical Habitat

Discretionary projects which use federal permits or federal funds on private lands that have the potential to impact critical habitat shall be conditioned to

avoid significant habitat modification or destruction consistent with federally adopted Habitat Recovery Plans or interim recovery strategies.

BR-P4. Development within Stream Channels

Development within stream channels shall be permitted when there is no lesser environmentally damaging feasible alternative, and where the best feasible mitigation measures have been provided to minimize adverse environmental effects. Development shall be limited to essential, non-disruptive projects as listed in Standard BR-S6 - Development within Stream Channels.

BR-P5. Streamside Management Areas

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, along streams including intermittent streams that exhibit in-channel wetland characteristics and off-channel riparian vegetation.

BR-P6. Development within Streamside Management Areas

Development within Streamside Management Areas shall only be permitted where mitigation measures (Standards BR-S8 - Required Mitigation Measures, BR-S9 - Erosion Control, and BR-S10 - Development Standards for Wetlands) have been provided to minimize any adverse environmental effects, and shall be limited to uses as described in Standard BR-S7 - Development within Streamside Management Areas.

BR-P7. Wetland Identification

The presence of wetlands in the vicinity of a proposed project shall be determined during the review process for discretionary projects and for ministerial building and grading permit applications, when the proposed building development activity involves new construction or expansion of existing structures or grading activities. Wetland delineation by a qualified professional shall be required when wetland characterization and limits cannot be easily inventoried and identified by site inspection.

BR-P8. Wetlands Banking

The County supports the development of a wetlands banking system that minimizes potential conversion of prime agriculture lands to wetlands.

BR-P9. Oak Woodlands

Oak woodlands shall be conserved through the review and conditioning of discretionary projects to minimize avoidable impacts to functional capacity and aesthetics, consistent with state law.

BR-P10. Invasive Plant Species

The County shall cooperate with public and private efforts to manage and control noxious and exotic invasive plant species. The County shall recommend measures to minimize the introduction of noxious and exotic invasive plant species in landscaping, grading and major vegetation clearing activities.

BR-P11. Biological Resource Maps

Biological resource maps shall be consulted during the ministerial and discretionary permit review process in order to identify habitat concerns and to guide mitigation for discretionary projects that will reduce biological resource impacts to below levels of significance, consistent with CEQA.

BR-P12. Agency Review

The County shall request the CDFW, as well as other appropriate trustee agencies and organizations, to review plans for development within Sensitive Habitat, including Streamside Management Areas. The County shall request NOAA Fisheries or USFWS to review plans for development within critical habitat if the project includes federal permits or federal funding. Recommended mitigation measures to reduce impacts below levels of significance shall be considered during project approval, consistent with CEQA.

BR-P13. Landmark Trees

Establish a program to identify and protect landmark trees, including trees that exhibit notable characteristics in terms of their size, age, rarity, shape or location.

Eel River Area Local Coastal Plan

Sections of the Eel River Area Plan that pertain to protection of biological resources include:

Section 30240, which states that environmentally sensitive habitat areas shall be protected from a significant disruption in habitat values. This section is further described above in State Regulations, California Coastal Act.

Section 30233 which discusses allowable uses of fill in coastal wetlands. Although no wetlands will be converted to uplands as a result of the Project, restoration is one of the allowable uses for placing fill in coastal wetlands.

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 CDFW, USFWS or NMFS;
- Have a substantial adverse effect on any riparian habitat or other Sensitive Natural Community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;
- Have a substantial adverse effect on state or federally protected wetlands (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;

- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; 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 one of the significance criteria identified in Appendix G of the current CEQA Guidelines.

- 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 study area is not located within the boundaries of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. As such, the Project would not conflict with the provisions of any of these plans. No impact would occur and the evaluation criterion is not discussed further in this Draft EIR.

3.4.4 Methodology

Potential impacts to biological resources from the Project are evaluated to determine compliance with applicable federal, state, and local permitting and design requirements. Although some invasive plant management activities may occur during construction, it is considered in this section independent of construction activities. Potential impacts related to special-status plants, animals, aquatic resources (wetlands and other Waters of the U.S. and State), and Sensitive Natural Communities are evaluated by assessing their location relative to ground disturbing activities. The evaluation also considers potential impacts to or changes in habitat type or extent after the Project is implemented, especially for sensitive habitats.

3.4.5 Impacts and Mitigation Measures

Impact BIO-1: Would the Project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW, USFWS or NMFS?

The Project has been designed to avoid and minimize impacts to listed and sensitive species to the extent possible through design considerations (e.g., the seasonal timing of construction work to avoid disturbing nesting birds, locating the parking area in a disturbed ruderal location). None-the-less, construction, invasive plant management and maintenance of the Project could directly and indirectly impact populations of special-status wildlife and plant species and their habitats that occur in the study area.

Fish and Other Aquatic Species

A key goal of the Project is to restore and expand the area of tidal influence and enhance habitat for native fish, invertebrates, wildlife and plant species. Increased

tidal exchange and enhancement of existing tidal channels in the Project Area is anticipated to provide a significant improvement to fish and other aquatic species' habitat as compared to existing conditions.

There is no critical habitat for Tidewater Goby in the Project Area, although critical habitat exists for this species within the Eel River estuary, adjacent to and approximately 900 feet (274 meters) east of the study area. Critical habitat for Chinook Salmon (California Coastal DPS) and Coho Salmon (Southern Oregon/Northern California ESU) exists within McNulty Slough. There is no critical habitat within the study area for Longfin Smelt, Green Sturgeon, Eulachon or Steelhead Trout. State-listed Longfin Smelt, such as those recently documented in newly restored Riverside Ranch, are present nearby (Kramer 2016). Pacific Lamprey, a California species of special concern, is known to migrate into the Eel River throughout the year (Stillwater Sciences 2010).

Construction, Dewatering and Relocation Activities

Impacts to special-status fish species, including Tidewater Goby, juvenile salmonids, Green Sturgeon, Longfin Smelt, Eulachon and Pacific Lamprey, could occur during various construction activities, including all work that requires excavation or fill in tidally influenced portions of the Project Area. Although salmonids and other estuarine or anadromous fishes are believed to be in low numbers in the Project Area where most work would occur, some individual animals almost certainly occur in tidal areas where fill or excavation is proposed and could be affected by construction activities. For example, installing cofferdams and pumping water could isolate and/or entrain fish. Hydraulic dredging could also entrain fish. In the short term, construction activities including dredging, fill, and levee breaching or lowering would result in disturbance to soils that could affect turbidity and suspended sediment, which in turn could degrade water quality and impair fish mobility.

Dewatering is proposed, as feasible, for Areas B, C, D and E in order to isolate work areas as much as possible. Fish currently have access to Areas A, B, C and D via the existing channel network (see Figure 3.9-4 in Section 3.9 Hydrology and Water Quality), therefore dewatering Areas B, C and D may adversely affect fish. Potential adverse impacts from dewatering include stranding or entrainment into pumps, mortality due to dewatering equipment, debris, or relocation.

Area A would be constructed during low tide, and would not be dewatered. Therefore equipment would be within the marsh and levee areas and would excavate within channels that contain water and aquatic species. Potential adverse impacts from construction within Area A include: crushing, injury and stranding of fish and other aquatic species, all of which can lead to mortality. These potential impacts would be significant. Mitigation Measure BIO-1a (below) would be implemented to reduce potential adverse impacts to these species from dewatering and construction activities, in addition to other potential stressors.

Finally, internal and external levee breaching would alter hydrologic functions (e.g., salinity, flow, velocity) which could create an environment intolerable for some life stages of Tidewater Goby. However, in the long-term, the Project would result in a net gain in suitable Tidewater Goby habitat, and an increase in available higher quality habitat by including backwaters and slow moving low salinity habitat. Recent

experience on the nearby Riverside Ranch/Salt River Ecosystem Restoration Project documented a rapid increase in Tidewater Goby abundance and use of newly available habitat in the first years after tidal habitat restoration (Kramer 2016). Tidewater Goby are expected to increase in abundance within the Project Area after estuarine restoration activities are complete.

Invasive Plant Management

Invasive plant management activities would occur within the dunes and estuarine restoration areas. Treatment activities of European beachgrass in the dunes would have no impact on aquatic species because aquatic habitat does not exist in that portion of the Project Area. Treatment of dense-flowered cordgrass in the estuarine restoration area would likely occur concurrent with, or just after, construction activities, and would occur thereafter as needed and as funding allows. Equipment operating in the marsh to remove dense-flowered cordgrass would pose similar potential adverse impacts to aquatic species as described above for construction activities. The use of land-based treatments for invasive plant management (top mowing, grinding, tilling, prescribed burning) may result in loose soil which may deliver sediment to the water column. Potential impacts from in-water and land based invasive plant management treatments would be reduced with implementation of Mitigation Measure BIO-1a (below). Invasive plant management treatments involving the use of herbicide, and potential impacts to fish and aquatic species from herbicide application, are discussed below under the “Water Quality” heading.

Maintenance

Maintenance activities include periodic infrastructure repair and maintenance of amenities (trail, non-motorized boat put-in, parking lot, road), and monitoring activities. The non-motorized boat put-in and potentially monitoring activities would be the only maintenance activities in proximity to aquatic species. Maintenance of the non-motorized boat put-in would be completed within the footprint of the proposed infrastructure and would not cause deterioration of aquatic habitat for fish species. Similarly, monitoring activities would be conducted on foot and would be minimally invasive to the surrounding environment. No impact to aquatic wildlife species would occur from maintenance activities.

Mitigation Measure: Implement Mitigation Measure BIO-1a.

Mitigation Measure BIO-1a: Avoidance and Minimization Measures for Fish and other Aquatic Species.

The following measures will be implemented to avoid and minimize impacts to fish and other aquatic species during construction, invasive plant management and maintenance activities:

- The in-water work window for construction, invasive plant management and maintenance activities will be limited to the dry-season (between June 15 and October 15) to avoid or minimize impacts to Tidewater Goby, juvenile salmonids, and Longfin Smelt. Although dry-season work windows may coincide with Tidewater Goby spawning and larval development, the footprint of available Tidewater Goby habitat may be smaller because summer conditions are typically drier, reducing the

area in which Tidewater Goby may be present. In addition, conducting work during the dry season will minimize the impact on water quality from sediment or from spills that could occur during construction, invasive plant management and/or maintenance activities (e.g., oil, fuel, hydraulic fluid) because there would be a lower probability sediment or chemicals would be mobilized to surface waters. Dredging and filling activities should be conducted as late into the construction work window as feasible, to minimize impacts to Goby burrows (Stillwater Sciences 2006), and because temperatures in the Project Area where dredging is likely to occur tend to be too warm for rearing salmonids after July (Wallace & Gilroy 2008, Ray 2018a).

- Project construction would be phased to allow Tidewater Goby, juvenile salmonids, Longfin Smelt and Pacific Lamprey to move on their own or be relocated to sites outside of where active ground disturbance is occurring. Before potential dewatering or other in-water Project activities begin, a qualified biologist shall ensure that native aquatic vertebrates, and large native invertebrates (if feasible), are relocated out of the construction footprint into a flowing tidal channel segment. Where dewatering needs to occur, all pump intakes will be screened in accordance with NMFS and CDFW fish screening criteria (NMFS 1997, CDFG 2010c). In deeper or larger areas, water levels shall first be lowered to manageable levels using methods to ensure no adverse impacts to fisheries and other special-status aquatic species occur. The qualified biologist shall then perform appropriate seining or other trapping procedures to a point at which the qualified biologist is assured that almost all individuals within the construction area have been caught. These individuals shall be kept in buckets with aerators and relocated to an appropriate flowing tidal channel segment or other appropriate habitat as identified by the qualified biologist in consultation with NMFS, USFWS and CDFW.
- A pre-construction fish screening shall take place before any in-water Project activities take place in channels that are not dewatered, or are partially dewatered in areas where Tidewater Goby and other native aquatic species have been known to occur (based on previous surveys, see Ray 2018b, and Scheiff and Gilroy 2013). The pre-construction fish screening shall include in-water movement in the proposed work area in order to scare fish species away from the work area.
- Amphibious vehicles, or other low ground pressure equipment, will not be allowed to contact the channel substrate where special-status fish species may be present. The vehicles will be operated in such a manner that they avoid causing erosion into the channels, to the extent possible.
- To minimize erosion effects, silt fencing (or a similar best management practice [BMP]) will be installed along the edge of the work area when adjacent to a waterway (as feasible) and in locations where native aquatic species typically occur (based on previous surveys Ray 2018b, Scheiff and Gilroy 2013, or CNDDb). Silt fencing shall be installed when

using methods that are most likely to cause erosion such as grinding, tilling, disking and digging/excavating. Silt fencing is not required if conducting construction, invasive plant management or maintenance activities by hand, or if the Project activity does not involve soil disturbance (such as top mowing, herbicide application or smothering).

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure BIO-1a provides protection measures during construction, invasive plant management and maintenance activities for aquatic species including seasonal work windows, relocation guidance for individual fish species if any are located within dewatering areas, and pre-construction actions. Mitigation Measure BIO-1a is consistent with applicable recovery plans (see Section 3.4.6 Cumulative Impacts for additional information on the recovery plans this Project upholds). The Project would result in a long-term benefit to Tidewater Goby, juvenile salmonids, Longfin Smelt, Eulachon, Green Sturgeon and Pacific Lamprey due to the establishment of access to additional and improved tidal areas. With implementation of Mitigation Measure BIO-1a, impacts derived from construction, invasive plant management, and maintenance activities would be less than significant.

Water Quality

Water quality may be a stressor to aquatic species during construction and following the first substantial rain event after construction due to increased sediment in the water column. The potential mobilization of sediment would be temporary, is not expected to persist beyond the first substantial rain event following the completion of construction, and is not considered a long-term threat to aquatic species. The last bullet listed in Mitigation Measure BIO-1a would reduce erosion associated with ground disturbing activities in proximity to where native aquatic species typically occur. Therefore, due to the temporal nature and with implementation of Mitigation Measure BIO-1a, impacts from a temporary increase in sediment are considered less than significant with mitigation.

The use of herbicide to control invasive plants has the potential to directly or indirectly affect the survival, health, or reproduction of non-target plants, and reduce plant cover leading to increased soil erosion and surface water runoff. The risks to non-target species from herbicide use depend on the application method; timing of the application; and plant species present, as well as environmental factors such as precipitation rates and soil types. If not properly managed, the use of herbicide for invasive plant management could result in adverse impacts to water quality (aquatic species' habitat) or non-target species. This impact is considered potentially significant.

Mitigation Measures: Implement Mitigation Measures HHM-2, HHM-4, WQ-1 and WQ-2.

The Project would implement Mitigation Measures HHM-2, HHM-4, WQ-1, and WQ-2, as defined from the Programmatic Final EIR for the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey and GHD 2013) hereafter referred to as the 2013 Spartina PEIR, to reduce potential impacts to water quality, aquatic species, and non-target plant species from the use of herbicide. The 2013 Spartina PEIR

measures have been slightly adapted to reflect that their implementation would also apply to treatment of European beachgrass, and to other project activities that could result in comparable potential impacts on water quality, aquatic species, and non-target plant species (e.g., use of equipment to implement the tidal restoration component of the project).

Mitigation Measure HHM-2: Accidents Associated with Release of Chemicals and Motor Fuel.

Contractors and equipment operators on site during Project activities will be required to have emergency spill cleanup kits immediately accessible. If fuel storage containers are utilized exceeding a single tank capacity of 660 gallons or cumulative storage greater than 1,320 gallons, a Hazardous Materials Spill Prevention Control and Countermeasure Plan (HMSPPCCP) would be required and approved by the NCRWQCB. The HMSPPCCP regulations are not applicable for chemicals other than petroleum products; therefore, the contractor shall prepare a spill prevention and response plan for the specific chemicals utilized during Project activities. This mitigation is intended to be carried out in conjunction with Mitigation WQ-2.

Mitigation Measure HHM-4: Avoid Health Effects to the Public and Environment from Herbicide.

For areas targeted for application of herbicide that are within 500 feet (152 meters) of human sensitive receptors (i.e., houses, schools, hospitals), prepare and implement a herbicide drift management plan to reduce the possibility of chemical drift into populated areas. The Plan shall include the elements listed below. To minimize risks to the public, mitigation measures for herbicide application methods related to timing of herbicide use, area of treatment, and public notification, shall be implemented by entities engaging in treatment activities as identified below:

- Herbicide will be applied in accordance with the manufacturer's label.
- CDFW will coordinate with the County Agricultural Commissioner to identify and avoid impacts to any nearby sensitive areas (e.g., schools, hospitals) that require notification prior to herbicide applications.
- CDFW will identify nearby sensitive habitat and, where feasible, establish buffer zones to avoid affecting sensitive receptors.
- Herbicide will be applied using the coarsest droplet size possible that maintains sufficient plant coverage while minimizing drift into adjacent areas.
- Herbicide shall not be applied when winds exceed 10 miles per hour or when inversion conditions exist (consistent with the herbicide labels); or when wind could carry spray drift into inhabited areas. Refer to Section 3.3 (Air Quality), for discussion on inversions.
- Public access to treatment sites will be restricted during treatment windows.
- No surfactants containing nonylphenol ethoxylate will be used.

Mitigation Measure WQ-1: Managed Herbicide Control

Herbicide shall be applied directly to plants and at low or receding tide to minimize the potential application of herbicide directly on the water surface, as well as to ensure proper dry times before tidal inundation. Herbicide shall be applied by a certified applicator or under the direct supervision of trained, certified or licensed applicators, and in accordance with application guidelines and the manufacturer label. The Project shall obtain coverage under the current statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the U.S. from Algae and Aquatic Weed Control Applications (SWRCB 2013).

Mitigation Measure WQ-2: Minimize Herbicide Spill Risks

Herbicide shall be applied by or under the direct supervision of trained, certified or licensed applicators. Herbicide mixtures shall be prepared by, or under the direct supervision of trained, certified or licensed applicators. Storage of herbicide and surfactants on or near the Project Area shall be allowed only in accordance with a Spill Prevention and Control Plan approved by the NCRWQCB; on-site mixing and filling operations shall be confined to areas appropriately bermed or otherwise protected to minimize spread or dispersion of spilled herbicide or surfactants into surface waters. This mitigation is intended to be implemented in conjunction with Mitigation Measure HMM-2.

Level of Significance: Less than significant with mitigation.

Mitigation Measures HMM-2, HMM-4, WQ-1 and WQ-2 provide guidelines on how herbicide can be applied and who can apply them, and requirements for spill clean-up kits to be onsite in order to address accidental spills of herbicide or motor fuel. With implementation of Mitigation Measures HMM-2, HMM-4, WQ-1 and WQ-2 potential impacts to aquatic species habitat (water quality) and non-target species from use of herbicide would be reduced to be less-than-significant.

Habitat Changes and Predation by Invasive Species

Estuarine restoration within the Project Area would benefit other aquatic species, including non-native species such as Sacramento Pikeminnow, which can prey on Tidewater Goby, juvenile salmonids, Longfin Smelt, and Pacific Lamprey. It is anticipated these potential impacts would be offset by the overall net gain in the post-construction quality and quantity of tidal habitats in the Project Area, which would allow populations of sensitive native aquatic species to expand into restored areas and be able to better withstand a potential increase in predation. Although invasive Sacramento pikeminnow are tolerant of low salinities, restoring brackish water habitat would provide refuge for native species from this invasive freshwater fish. Therefore, a less than significant impact to aquatic species due to habitat changes and potential increases in predation would occur.

Bird Species

Resident and Migratory Birds

Special-status avian species could be present at the Project Area year-round (nesting, wintering, migrating and fly-over species) and could be impacted by noise, ground and/or visual disturbance during Project construction and invasive plant management activities. No trees are present within the Project Area, however abundant marsh habitat exists which is used by many bird species. Construction activities which may adversely impact special-status bird species include: channel excavation, levee breaching, lowering and removal of levees, filling of wetlands to create high marsh and habitat ridges, excessive noise, and removal of or damage to vegetation during construction (e.g., in order to clear access pathways). Invasive plant management activities that may adversely impact special-status bird species include: prescribed burning, herbicide application, mechanical removal of invasive plants, excessive noise, and visual impacts. For wintering and fly-over avian species, these potential impacts are considered less-than-significant because ecologically similar breeding and foraging habitat is regionally abundant and not a limiting factor for these species. Maintenance activities, including trail and parking lot maintenance, would typically not include the use of heavy machinery in the tidal marsh or dunes and would have a less than significant impact on migratory birds.

For ground nesting species, which nest in high grasses or similar vegetation in marshes, wetlands, dunes or uplands, the construction and invasive plant management activities listed above could result in injury, mortality, or nest abandonment due to earth movement, vegetation removal and noise. Project activities (including construction and invasive plant management) occurring during the avian breeding season which generally occurs March 16th through July 31st in northern California may have an adverse impact on breeding success for ground nesting special-status bird species. Adverse impacts to ground nesting special-status bird species would be a significant impact.

Mitigation Measures: Implement Mitigation Measure BIO-1b.

Mitigation Measure BIO-1b: Conduct Pre-construction Nest Surveys for Ground Nesting Special-status and Migratory Avian Species

The following measures will be implemented prior to and during construction and invasive plant management activities to avoid and minimize impacts to nesting birds. Maintenance activities that include ground disturbance are also subject to this mitigation measure.

- CDFW shall attempt to conduct all Project construction and invasive plant management activities in areas where nesting could occur to the period outside the bird nesting season (generally August 1 to March 15). If Project activities are proposed to occur outside the bird nesting season, no further mitigation is necessary. If activities are proposed in the bird nesting season (generally considered between March 16 and July 31), a qualified biologist shall conduct pre-construction surveys within the vicinity of the impact area to check for nesting activity and to evaluate the site for nesting bird species. The qualified biologist shall conduct a minimum of one pre-construction survey within the seven-day

period prior to Project construction or invasive plant management activities. If Project activities lapse for seven days or longer during the nesting season, a qualified biologist shall conduct a supplemental avian survey before Project work is reinitiated.

- If an active nest is found, the qualified biologist shall determine the size of an appropriate construction-avoidance buffer zone to be established around the nest and/or operational restrictions in consultation with the CDFW and USFWS (if Federally-listed). Buffer zones shall be delineated with flagging and maintained until the nestlings have fledged and are independent of the nest. Buffer sizes shall take into account factors such as (1) noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity; (2) distance and amount of vegetation or other screening between the construction site and the nest in order to reduce visual stress; (3) sensitivity of nesting species and behavior of the nesting birds; (4) location of the nest in relation to areas to be treated with herbicide.

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-1b provides protection measures to special-status ground nesting birds if Project activities are implemented in areas that could potentially contain nesting birds. Implementation of this measure would mitigate potential impacts to special-status, resident and migratory birds to less-than-significant levels by requiring pre-construction surveys by a qualified biologist to determine whether special-status, resident, or migratory bird nests are present at or near the Project Area and ensure the protection of nests and nestlings via buffer zones until they have fledged.

Western Snowy Plover

The Western Snowy Plover occurs on and above the wave slope up to the foredune west of the Project Area. The largest current concentrations of nests are located along the southern portion of the Project Area near the mouth of the Eel River (Colwell 2019). Critical habitat was designated in 1999 and revised in 2012 (77 Federal Register [FR] 36727-36869) and includes the entire dune complex from the Humboldt Bay South Spit, south to Centerville Beach, including the dunes within the Project Area and adjacent beaches (see Figure 3.4-5 – Critical Habitat for Western Snowy Plover).

Proposed dune enhancement has the potential to directly and indirectly affect this species through long-term improvements in habitat, as well as through temporary visual and noise disturbance during European beachgrass removal activities. Prescribed burning and herbicide use for European beachgrass removal is not anticipated to harm Western Snowy Plovers, because Plovers utilize open beach areas rather than dense stands of European beachgrass. Drift from herbicide application could adversely impact Western Snowy Plover habitat, although these potential impacts would be unlikely because herbicide would be hand applied and very targeted when applied proximate to nesting habitat (i.e., along the fringes of European beachgrass stands near open sand areas). Equipment necessary for

European beachgrass control, such as bulldozers, may harm Western Snowy Plover through visual disturbance, and disturbance to nests or habitat when accessing work areas. Additionally, equipment utilized in construction and dense-flowered cordgrass removal may utilize the dunes to access the construction and tidal portion of the invasive plant management area, which may harm Western Snowy Plover individuals or habitat. The noise and visual disturbance from equipment conducting invasive plant management, or accessing the tidal portion of the Project Area, may also adversely impact Western Snowy Plover. Although dune restoration and European beachgrass removal is expected to result in a long-term net benefit for Western Snowy Plover, there could be short term adverse impacts from noise and equipment movement that could be significant.

Mitigation Measures: Implement Mitigation Measure BIO-1c.

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

Suitable nesting habitat for Western Snowy Plover includes areas of open sand, or sparsely vegetated dunes, above the high tide line (NAVD88). This measure applies to all Project activities that occur within 50 feet (15 meters) of suitable Western Snowy Plover habitat. For the purposes of this measure, Project activities include construction; construction-related access; and all invasive plant management activities targeting removal of European beachgrass (including prescribed burning, herbicide application, manual or mechanical removal, or movement of equipment through European beachgrass).

- Project activities in Western Snowy Plover nesting habitat shall occur if feasible between September 16 and March 15, outside of the generally accepted Western Snowy Plover nesting season, unless CDFW and USFWS approve a wider season treatment based on survey data and site-specific conditions.
- If any proposed Project activities occur in suitable habitat in the dunes within the Western Snowy Plover nesting season (generally between March 16 and September 15), a qualified biologist shall conduct pre-construction surveys within the vicinity of the impact area to check for nesting activity. The qualified biologist shall conduct a minimum of one pre-construction survey within the seven-day period prior to Project activities. If Project activities lapse for seven days or longer during the nesting season, a qualified biologist shall conduct a supplemental avian survey before Project work is reinitiated.
- If an active Western Snowy Plover nest is found, the qualified biologist shall establish a 300-foot avoidance buffer zone around the nest and/or implement operational restrictions in consultation with CDFW and the USFWS. No herbicide application will occur within this buffer zone during the Western Snowy Plover nesting period unless approved by CDFW and the USFWS. Buffer zones shall be delineated with flagging and maintained until the chicks have fledged, or nesting activity has ceased. Buffer zones may exceed 300 feet (91 meters) upon taking into

account factors such as (1) noise and human disturbance levels at the Project site at the time of the survey and the noise and disturbance expected during the Project activity; (2) distance and amount of vegetation or other screening between the Project activity site and the nest in order to reduce visual stress; (3) sensitivity of individual nesting species and behaviors of the nesting birds; (4) location of the nest in relation to areas to be treated with herbicide.

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-1c avoidance and minimization measures within 50 feet (15 meters) of suitable habitat for Western Snowy Plover, including seasonal work windows, pre-work surveys, restrictions on the use of heavy equipment, and guidelines to herbicide application. Implementation of Mitigation Measure BIO-c would reduce impacts to Western Snowy Plover to a less than significant level.

Reptiles and Amphibians

Northern Red-legged Frogs are known to occur within the freshwater-dominant portions of the Project Area, located in the northern extent of Areas C and E (M. van Hatten pers. comm. 2019). Implementation of the Project is expected to result in increased tidal amplitude, thereby resulting in conversion of some areas of fresh to slightly brackish marsh and freshwater shrub wetland to tidally influenced saltwater/brackish marsh and subtidal channels. However, freshwater seeps are located north of Areas C and E, and although tidal amplitude would increase, existing habitat for Northern Red-legged Frog is expected to remain suitable in and near the freshwater seeps.

Additional potential habitat characterized as a freshwater dominant pond exists in Area A. However, Northern Red-legged frog have not been documented in this pond (CDFW 2019a), presumably because water in the pond is surrounded by tidally influenced marsh and because the water is more saline than preferred by the species. Implementation of the Project is not expected to significantly change the available Northern Red-legged Frog habitat in the northern extent of Areas C and E, or remove known habitat in the freshwater pond in Area A. Therefore potential impacts to Northern Red-legged Frog breeding and rearing habitat would not significantly change from implementation of the Project, and are considered less than significant.

Although Northwestern Pond Turtles have not been observed in the Project Area, they have been reported in the Project vicinity and could inhabit fresh and brackish water wetlands in the Project Area. Suitable habitat for this species is located in the northern extent of Areas C and E, where the freshwater seeps occur. As described above, the freshwater seeps would not be affected by the Project and suitable habitat for this species would remain unaffected by the Project. It is uncertain whether Northwestern Pond Turtle breeding occurs in the cool coastal climate, and in any case upland breeding habitat is not expected to be impacted by the Project. Accordingly, Northwestern Pond Turtle breeding and rearing habitat in the Project Area would not significantly change as a result of implementation of the Project, and any potential impacts are considered less than significant.

During Project activities, some direct mortality to Northern Red-legged Frog and Northwestern Pond Turtle could occur during excavation of wetlands or channels (construction), or invasive plant management activities in areas of suitable habitat extent, should individuals be present during those activities. As a result, Project-related impacts to Northern Red-legged Frogs and Northwestern Pond Turtle could be significant if individuals are present when equipment is operating.

Mitigation Measures: Implement Mitigation Measure BIO-1d.

Mitigation Measure BIO-1d: Avoid, and Minimize Potential Impacts to Northern Red-legged Frog and Northwestern Pond Turtles

The following measures will be incorporated into the Project to avoid and minimize impacts to Northern Red-legged Frog and Northwestern Pond Turtles during construction, invasive plant management, and maintenance activities within 50 feet (15 meters) of suitable habitat. Suitable habitat is located in the northern extent of Areas C and E; therefore, this Mitigation Measure applies to construction, invasive plant management, or maintenance activities within 50 feet (15 meters) of the northern extents of Areas C and E.

- Project construction, invasive plant management, or maintenance activities shall be limited to the period of the year between July 1 and October 30 to avoid disturbance to breeding Northern Red-legged Frogs, as feasible.
- If work is proposed during the breeding season (generally December to February), a qualified biologist shall conduct two surveys in proposed work areas within suitable habitat as defined above. Any Northern Red-legged Frog egg masses located shall be relocated to suitable aquatic habitat outside of proposed work areas.
- Throughout areas of suitable habitat, any juvenile or adult Northern Red-legged Frog or Northwestern Pond Turtle encountered during construction, invasive plant management or maintenance activities will be safely relocated by a qualified biologist to suitable habitat out of harms way.

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-1d identifies suitable habitat for Northern Red-legged Frog and Northwestern Pond Turtle, and avoidance and minimization measures within 50 feet (15 meters) of suitable habitat. These measures include seasonal work windows, pre-work surveys, and relocation guidance. Implementation of Mitigation Measure BIO-1d would reduce potential impacts caused by construction, invasive plant management or maintenance activities to Northern Red-legged Frog and Northwestern Pond Turtle to a less than significant level.

Mammals

The Project would result in changes in habitat types in the Project Area, including a shift from fresh to slightly brackish marsh, freshwater shrub wetland to tidally influenced salt water/brackish channels, and an increase in intertidal channel/mudflat. This change would alter vegetation composition within the Project

Area, which could impact bat foraging habitat. This impact is considered less than significant because ecologically similar foraging habitat is regionally abundant and not a limiting factor for these species, and because bats are mobile and able to readily respond to shifts in foraging availability over short distances. The Project would not impact or modify buildings, bridges, rocky areas, or trees, which could provide roost sites, and no potential impact on roosting habitat is anticipated to occur within the Project Area. Other mammals (Humboldt Mountain Beaver, Fisher, Sonoma Tree Vole, and North American Porcupine) have an extremely low potential to occur in the Project Area due to an absence of suitable habitat, and would not be impacted by the Project.

Marine mammals, including Pacific Harbor Seal and California Sea Lion, have been observed in McNulty Slough and have high potential of occurring in and adjacent to the Project Area. Potential impacts to these species include temporary adverse impacts on water quality (e.g., an increase in turbidity in McNulty Slough during construction) which could impact their ability to forage; however both of these species are highly mobile and suitable habitat is abundant regionally. Underwater noise issues are not anticipated as high impact pile drivers or other highly noisy pieces of equipment are not planned for use. Potential adverse impacts to marine mammals would be temporary. Because of these reasons, the Project would have a less than significant impact on mammals.

Invertebrates

Invertebrate species with moderate or high potential to occur in the study area include the Obscure Bumble Bee. It is unlikely that the Project would impact Obscure Bumble Bee. The Project may result in a small, temporary reduction of foraging habitat for this species; however, due to the regional abundance of similar habitats, temporary habitat loss is not expected to result in an adverse effect on the species. No Project-related impacts are anticipated.

Special-Status Plants

Eight special-status plant species occur within the Project Area: four species – Lyngbye's sedge, Humboldt Bay owl's clover, Point Reyes bird's-beak, and seaside angelica – are known to occur in the estuarine restoration portion of the Project Area, and five species – dark-eyed gilia, short-leaved evax, beach layia, American glehnia, and seaside angelica – are known to occur in the dune restoration portion of the Project Area (Table 3.4-2). Current locations of special-status plant populations and special-status plant habitat are based upon data collected by Pacific Coast Restoration in 2018, as depicted on Figure 3.4-2; however, the area and size of these populations may change over the life of the Project. As described below, implementation of the Project would significantly benefit these special-status plants in the long-term by improving habitat conditions preferred by native species and controlling populations of invasive plants; however temporary adverse impacts to these species may occur during construction and invasive plant management activities.

Construction and Invasive Plant Management Activities (Except Prescribed Burns)

Short-term potential adverse effects on special-status plants that may occur due to construction and invasive plant management activities include inadvertent trampling

or crushing by equipment, and potential impacts on the survival, health, or reproduction of plants if accidentally exposed to herbicide (see below for a discussion of the potential effects of prescribed fire on special-status plants). With the exception of prescribed burning, the invasive plant treatment methods specific to the removal of dense-flowered cordgrass, including potential impacts on special-status plants, were analyzed in the 2013 *Spartina* PEIR (H.T. Harvey and GHD 2013). The types of impacts on special-status plants that may be caused by the removal of European beachgrass in the dune restoration area would be similar (e.g., damage from equipment or exposure to herbicide), and also offset by the mitigation measures prescribed in the 2013 *Spartina* PEIR. Specifically, the Project would implement Mitigation Measures HHM-2, WQ-1 and WQ-2 as defined in the 2013 *Spartina* PEIR to avoid and reduce ground disturbance and invasive plant treatment-related impacts, including those that may be caused by the application of the herbicide imazapyr on dense-flowered cordgrass and European beachgrass.

Mitigation Measure BIO-1e would also be implemented to avoid inadvertent damage to plants from Project activities located proximate to known populations of special-status plants. With the exception of Lyngbye's sedge, all of the special-status plants known to the Project Area are annual species that typically seed by late summer (September); the exception is Point Reyes birds-beak, whose flowering period extends from June to October (Pacific Coast Restoration 2018b). All estuarine restoration activities and invasive plant management treatments would occur outside of the nesting bird window, which is generally considered between March 16 and July 31, which would ensure that most Project-related activities would occur after annual plants have seeded. Where there could be an overlap in a proposed work window and the blooming period of an annual plant species, and/or where work would be located near populations of Lyngbye's sedge, the staking requirements provided in Mitigation Measure BIO-1e would be implemented to minimize impacts to special-status plants in or near the footprint of the proposed work.

Finally, dune habitat special-status plant species almost entirely occur in dune mat habitat and where sand still moves, outside of areas of European beachgrass. Therefore, potential impacts to these species, such as trampling, mortality or general harm due to equipment use, are only expected to occur along the fringe of European beachgrass locations. For these special-status plants, avoidance shall occur by using only treatment methods that are highly selective; for example, heavy equipment would not be operated where these plants occur (see Mitigation Measure BIO-1e).

The implementation of the mitigation measures from the 2013 *Spartina* PEIR along with Mitigation Measure BIO-1e would reduce impacts to special-status plant species from construction and invasive plant management activities to a less than significant level.

An analysis of the impacts of prescribed burning on special status plants is provided in the following subsection.

Mitigation Measure: Implement Mitigation Measures BIO-1e, HHM-2, WQ-1 and WQ-2.

Mitigation Measure BIO-1e: Minimize Impacts to Special-Status Plant Species

A qualified biologist shall stake out locations of special-status plant populations prior to construction. Staking efforts shall target consolidated populations (i.e., more than 10 plants in a grouping), and shall only identify annual species if work is proposed during their blooming period. The qualified biologist shall also provide training to construction or plant management crews to ensure that they avoid and minimize impacts to these plants.

No heavy equipment shall be used to carry out invasive plant management within 10 feet (3 meters) of dune mat habitat.

Project-related access routes located in the dunes shall be marked and shall avoid dune mat habitat.

Level of Significance: Less than significant with mitigation.

Mitigation Measures BIO-1e would protect special-status plant species during ground disturbing activities, including invasive plant management. Mitigation Measures HHM-2, WQ-1 and WQ-2 provide guidelines on how herbicide can be applied and who can apply them, and requirements for spill cleanup kits to be onsite in order to address accidental spills. With implementation of Mitigation Measures BIO-1e, HHM-2, WQ-1 and WQ-2 potential impacts to special-status plant species would be reduced to a less than significant level.

Prescribed Burns

Prescribed burning is considered a possible invasive plant treatment method under the Project due to the large-scale stands of dense-flowered cordgrass and European beachgrass that dominate the Project Area, and the significant amount of large wood onsite that may make mowing or excavation difficult in the estuarine restoration area. Prescribed burns would be used as an initial treatment method to reduce biomass and expose aboveground large wood. Subsequent manual or mechanical treatments, or herbicide applications would be applied following prescribed burning, as needed.

Prescribed burns have the potential to harm special-status plant species (i.e., damage or destroy individual plants) where those plant communities overlap with a prescribed burn area; however these plant communities are anticipated to ultimately benefit from prescribed burning due to the subsequent removal of invasive plants that otherwise limit their ability to persist in the Project Area. Mitigation Measure BIO-1f would be implemented to avoid potential impacts to special-status plant species while implementing prescribed burns.

Mitigation Measures: Implement Mitigation Measure BIO-1f.

Mitigation Measure BIO-1f: Avoidance and Minimization of Special-status Plant Species during Prescribed Burns

In order to minimize potential impacts to special-status plant species during a prescribed burn, the following measures will be implemented:

Prescribed burns will occur between August 1 and March 15 (i.e., outside the nesting bird window,) which is after the primary blooming period for annual species known to the dunes.

All prescribed burn treatments will be conducted in accordance with an approved burn plan coordinated with the California Department of Forestry and Fire Protection (CAL FIRE).

Level of Significance: Less than significant with mitigation.

Mitigation Measure BIO-1f provides prescribed burn timeframe windows and requires coordination with CAL FIRE prior to conducting a burn. With implementation of Mitigation Measure BIO-1f, potential impacts to special-status plant species due to prescribed fire would be reduced to less than significant.

Post-Construction Potential Habitat Changes

The Project is anticipated to have overarching positive benefits to special-status plant species through the eradication of invasive plants in the estuarine and dune restoration areas, and because of increased tidal influence. However, short-term adverse impacts may potentially occur following construction activities. The expansion and increase in depth of tidal waters is anticipated to have a short-term adverse impact to some special-status plant species, due to increased duration of inundation. This potential impact would be temporary, because plants that may be subjected to increased total inundation are anticipated to migrate upslope and inhabit newly expanded habitat. Special-status dune plants are expected to expand in population size following the removal of European beachgrass. Special-status plants either observed or with potential to occur in the Project Area, and each species' response to increased post-construction habitat changes, including increased frequency of tidal inundation and removal of invasive plant populations is described below.

Tidal Marsh Habitat Special-status Plants

Lyngbye's Sedge

Lyngbye's sedge is a perennial species found within saltmarsh habitat, mostly along McNulty Slough on the outboard side of the levees in southern and central Area A. Post-construction conditions, i.e. greater tidal amplitude, within the Project Area are not anticipated to adversely affect this species due to the rhizomatous nature of its rooting structure, and its ability to establish in suitable habitat. Additionally, the tidal elevations of McNulty Slough are not anticipated to vary significantly after the Project is implemented as compared to pre-Project conditions, and therefore Lyngbye's sedge is unlikely to be impacted. Implementation of the Project is anticipated to improve and expand habitat for this species and increase its range and abundance after dense-flowered cordgrass is removed. No mitigation would be implemented.

Humboldt Bay owl's-clover

In general, Humboldt Bay owl's-clover is found in relatively high elevation saltmarsh in native saltmarsh patches. Within the Project Area, it is located in patches in southern Area A, Area B, and to a lesser degree in Area D along or close to McNulty Slough. Post-construction conditions – and specifically greater tidal amplitude within the Project Area – are anticipated to cause this species to establish into newly

expanded coastal salt and brackish marsh habitat types due to improved habitat conditions (i.e., increased number of subtidal channels and improved hydrologic connection with McNulty Slough). Minimal changes to tidal elevation in Area A are expected following construction activities. The channel excavations proposed in Areas A and B are located in the general pathway of an observed population of Humboldt Bay owl's-clover. If feasible, this species will be avoided during channel excavation. In Area A, this species is anticipated to be re-distributed to areas adjacent to and downstream of the proposed excavated channel, due to seed transport via the proposed channel. In Areas B and D, enhanced hydrology is anticipated to transport seeds further within the Project Area where they would be deposited in saltmarsh areas adjacent to the proposed channel excavation in Area B. Implementation of the Project is anticipated to improve habitat for this species after dense-flowered cordgrass is removed. No mitigation would be implemented.

Point Reyes bird's-beak

Point Reyes bird's-beak is located in the southern portion of Area A and in Area B within saltmarsh habitat. Similar to Humboldt Bay owl's-clover, the BR-1 breach and excavation in Area A would be located in the general vicinity of an observed population of Point Reyes bird's-beak. If feasible, this species will be avoided during channel excavation. The tidal elevation in Area A is expected to change minimally, and this species is anticipated to be re-establish in newly expanded habitat adjacent to and downstream of the proposed excavated channel, due to tidal seed transport. Re-distribution of this species due to the improved hydrology is anticipated throughout the tidal marsh portion of the Project Area. Implementation of the Project is anticipated to benefit this species as coastal saltmarsh would expand in the study area and would be enhanced by increased tidal influence. Implementation of the Project is anticipated to improve habitat for this species after dense-flowered cordgrass is removed. No mitigation would be implemented.

Seaside angelica

Seaside angelica grows at the upper marsh margins, especially in the transition zone to coastal dunes, and also along the sides of levees. Implementation of the Project involves channel excavation into upper Area B, A and E, which is where seacoast angelica has been observed. Habitat is anticipated to become increasingly estuarine in this area due to the channel excavation. Existing freshwater seeps north of Area E and the transition zone between the dunes to the west and the saltmarsh area is not expected to change. Therefore, although portions of the Project Area where seaside angelica has been observed would become more brackish and less freshwater dominant, abundant habitat exists for this species in the transitional area between the saltmarsh and the dunes and in the upper fringes of Area E, C and D where freshwater seeps would remain. No mitigation would be implemented.

Eelgrass

This species was observed in North Bay and McNulty Slough outside the Project Area (Pacific Coast Restoration 2018b, also mapped by Garwood 2018). Post-construction conditions within the Project Area are anticipated to benefit this species, and potentially cause the species to expand its range in the Project Area

due to the channel excavation in southern Area A and Area B. No mitigation would be implemented.

Coastal Dune Habitat Special-status Plants

Dark-eyed gilia

Dark-eyed gilia is an annual herb that is predominantly located throughout the existing dune mat habitat in the study area. Occurrences of this species are expected to increase following removal of European beachgrass, which has displaced dune mat. Until Project actions result in greater movement of sand, suitable habitat is anticipated to remain where existing species were observed during vegetation mapping (Figure 3.4-2; Pacific Coast Restoration 2018b). Implementation of the Project is anticipated to improve habitat for this species after European beachgrass is removed and sand movement in the Project Area increases.

Short-leaved evax

Short-leaved evax is an annual herb that is present in the dune mat vegetation alliance within the Project Area. This species was observed along the entirety of dune mat habitat within the dunes north of North Bay, and is particularly concentrated in the northern portion of the Project Area. Implementation of the Project is anticipated to improve habitat for this species after European beachgrass is removed and there is consequently greater movement of sand.

Beach layia

Beach layia occurs in dune mat, with two disjunct population, one in the northern and one in the southern sections of the dune restoration area. Implementation of the Project is anticipated to improve habitat for this species after European beachgrass is removed.

American glehnia

American glehnia occurs in at a few scattered locations in dune mat in the dune restoration area. Implementation of the Project is anticipated to improve habitat for this species after European beachgrass is removed.

In summary, the proposed Project is a restoration project designed to improve and expand native plant habitat. Post-construction conditions within the Project Area, including tidal inundation changes and the removal of dense-flowered cordgrass and European beachgrass, is not anticipated to adversely affect special-status plant populations due to the adaptability of each plant species as discussed above and because the Project makes improvements in the habitat conditions necessary for these species to expand. A less than significant impact would occur.

Maintenance

Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, as well as monitoring activities. These activities would occur in previously disturbed areas and would continue to support public recreation. No special-status plants were

observed in these areas, and none are expected to occur in areas where maintenance would occur.

Specific monitoring activities are to be determined, however are anticipated to include observations and measurements to determine whether the Project has been successful in improving habitat conditions for special-status plants and wildlife. Observations would likely occur on foot or by non-motorized boat and would not include the use of heavy machinery. Adverse impacts to special-status plants from monitoring activities are not anticipated, and the overall impact from maintenance activities would be less than significant.

Impact BIO-2: Would the Project 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 CDFW or USFWS?

Eleven Sensitive Natural Communities (S1 through S3 ranking) totalling 214.35 acres (86.74 hectares) were identified within the study area (Table 3.4-2). Under the Coastal Act, the Sensitive Natural Communities would also likely be considered ESHA, which is assumed in this analysis. See Figures 3.4-3 for locations of mapped Sensitive Natural Communities within the Project Area.

Riparian habitat does not exist in the study area, as no freshwater channels exist.

Construction

The Project would implement construction activities to improve tidal exchange, and thereby restore and improve the diversity of native saltmarsh habitat. In order to improve tidal exchange, existing levees would be lowered adjacent to McNulty Slough in Areas A, B, C and D; levees would be removed between Areas A and B, B and C and C and D, and channel excavation would take place in southern Area A, central Area B and Area E (see Figure 2-3 – Conceptual Design Elements). Construction would also include: high marsh creation, habitat ridges, and the installation of ditch blocks and large wood. Fill would be placed in Area B and in the southern portions of Areas A, C and D, totalling approximately 45.4 acres (18.4 hectares). The fill would be placed predominantly in intertidal channel/mudflat and coastal salt and brackish marsh and fresh to slightly brackish marsh habitat types to create transitional high marsh and habitat ridges. According to GIS analysis of vegetation mapping (Figures 3.4-3), construction activities would potentially adversely affect Sensitive Natural Communities due to earth work and earth movement (excavation and filling) in the tidal marsh portion of the Project Area.

Although adverse impacts would occur, these impacts are anticipated to be temporary. Once implemented, the Project would result in an overall benefit to native vegetation and Sensitive Natural Communities affected by construction activities, due to increased variations in elevation and tidal exchange within the high marsh and habitat ridge areas. It is expected that there would be a long-term increase in the area of Sensitive Natural Communities and ESHA resulting from the Project due to the restored natural conditions within the tidal marsh. A less than significant impact would occur.

Invasive Plant Management

The Project would also implement invasive plant management activities to control dense-flowered cordgrass, dwarf eelgrass, and European beachgrass, which is expected to have a long-term positive impact on Sensitive Natural Communities, including ESHA, as well as native plant and wildlife species in the tidal marsh and dunes. Efforts to control the invasive plants would consist of either mowing, grinding, excavation, prescribed burning, smothering or herbicide application, or a combination of approaches. Invasive plant management would occur independent of construction activities. Sensitive Natural Communities are generally not extensively intermixed with invasive plants because invasive plants displace most native species, therefore Sensitive Natural Communities are generally found adjacent to areas of invasive plants within the Project Area.

Dense-flowered cordgrass

Sensitive Natural Communities found adjacent to dense-flowered cordgrass include: *Juncus lescurii* (salt rush swales) alliance and a small area of *Leymus mollis* (sea lyme grass patches) alliance in the southern extent of the Project Area. Treatment of dense-flowered cordgrass may temporarily affect both Sensitive Natural Communities, however the removal of dense-flowered cordgrass would demonstrably improve habitat for these Sensitive Natural Communities because there would be greater availability for natural recruitment which is currently displaced by dense-flowered cordgrass. Potential impacts would be temporary, and benefits to Sensitive Natural Communities outweigh the potential temporary impacts. Therefore, a less than significant impact would occur and no mitigation would be implemented.

Dwarf eelgrass

Dwarf eelgrass was observed in McNulty Slough between 2008 and 2011, however recent surveys by CDFW (2018) did not detect the species. If observed in the future, dwarf eelgrass would be removed from McNulty Slough using manual removal or smothering. Native eelgrass has been consistently observed in McNulty Slough. If warranted, control of dwarf eelgrass would occur on the Ocean Ranch side (west side) of McNulty Slough, from the edge of the perimeter levee to mean low water and would likely occur between June and August, concurrent with eelgrass surveys and flowering period of the species. Manual removal would utilize hand tools to detach rhizomes while the top of the plant is pulled by hand, and smothering would involve placement of burlap fabric on top of stands of dwarf eelgrass to block sunlight. Standard water quality best management practices would be utilized to minimize sediment from entering McNulty Slough. Removal of the species utilizing the methods discussed would result in a less than significant impact to native eelgrass, and no mitigation would be implemented.

European beachgrass

Sensitive Natural Communities found adjacent to European beachgrass include: *Salix hookeriana* (coastal dune willow thickets) shrubland alliance (in the northern extent of the Project Area), and *Abronia latifolia* - *Ambrosia chamissonis* (dune mat) alliance. Implementation of primary or secondary treatments to eradicate European beachgrass is expected to significantly improve Sensitive Natural Community habitat availability in the long-term. In the short-term, removal of European

beachgrass adjacent to the coastal dune willow thicket is not expected to adversely impact this Sensitive Natural Community because no willow thicket would be removed or modified. As described in Impact BIO-1, dune mat habitat does not typically overlap with European beachgrass and treatment activities would only potentially affect this Sensitive Natural Community incidentally due to driving or walking, or when conducting treatment activities on the fringe of European beachgrass colonies. Although potentially significant, these impacts would be reduced to less than significant levels through implementation of Mitigation Measures BIO-1e and BIO-1f, which prescribes methods of European beachgrass removal (including prescribed burning) dependent on distance to areas of existing dune mat alliance communities.

Mitigation Measures: Implement Mitigation Measures BIO-1e and BIO-1f.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure BIO-1e and BIO-1f would reduce the potential impact to Sensitive Natural Communities found in the dunes during invasive plant management activities to a less-than-significant level.

Maintenance

Maintenance activities would occur after Project construction activities, and either after or concurrent with invasive plant management activities. Maintenance activities could include periodic repairs to the access road and parking area, cleaning debris from the non-motorized boat put-in and trail bridges, and mowing vegetation along the trail system. Maintenance would also include monitoring, which would potentially include observations of Sensitive Natural Communities and ESHA on foot or in a non-motorized boat. Because these impacts would be temporary and not require the use of heavy equipment in Sensitive Natural Communities or ESHA, they would be considered less than significant.

Impact BIO-3: **Would the Project have a substantial adverse effect on state or federally protected wetlands (including but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

Construction Activities

The study area includes approximately 564.9 acres (2286 hectares) of one- or three-parameter wetlands, or open waters, collectively known as aquatic resources (see Table 3.4-1). Construction of the estuarine restoration portion of the Project would result in direct and indirect impacts to aquatic resources from excavation of tidal channels; levee breaching, lowering and removal; placement of soil to create high marsh habitat, habitat ridges, and to install ditch blocks; installation of large wood; and construction of public access features, including improvements to the access road at the north end of the study area. See Figure 2-3 (Conceptual Design Elements) for the location of earthwork including excavation and fill, and Figure 3.4-1 (Existing Aquatic Resources) for the location of aquatic resource types. Construction-related impacts could include direct disturbance (removal, crushing, damage) of wetland vegetation by heavy equipment; increased turbidity and degradation of aquatic habitat; soil compaction; spread of invasive plants to new

areas; and water contamination from inadvertent spills associated with equipment use in wet areas. In addition to construction-related disturbance, excavation and fill activities would result in some aquatic habitat types transitioning to another aquatic habitat type. For example, excavation of new tidal channels would convert some areas of coastal salt and brackish marsh to subtidal habitat, and placement of soil to create high marsh habitat would convert some areas of intertidal mudflat and subtidal habitat to coastal salt and brackish marsh. Project implementation would not, however, result in conversion of aquatic resources to upland, and would not result in a net loss of wetland acreage from placement of soil or other fill material.

Table 3.4-5 summarizes the acreage of each aquatic resource type that would be impacted by the proposed estuarine restoration activities. In total, construction of the Project, including all earthwork, would directly impact about 82.10 acres (33.2 hectares) of aquatic resources within the study area. Implementation of Mitigation Measure BIO-3, which includes a series of BMPs for work in sensitive areas, would reduce short-term and temporary impacts to aquatic resources during construction.

In the long-term, the Project would restore tidal flows within the estuarine restoration area to create a mosaic of saltmarsh, intertidal mudflat, and subtidal channels. The tidal elevation range in portions of the restoration area would increase by up to two feet (0.6 meters), which would alter the location and extent of existing habitats, and in particular would transition some existing areas of coastal salt and brackish marsh to intertidal mudflat. In turn, it is anticipated some coastal salt and brackish marsh communities would transition to higher elevation areas, where the depth and duration of tidal inundation would be better suited to their establishment.

Table 3.4-5 Construction Impacts to Aquatic Resources

Project Component	Other Waters (acres)			Aquatic Resource Type (acres)				Total Construction Impact (acres)
	Sub-tidal channel	Inter-tidal channel/mudflat	Fresh-water Pond	Coastal salt and brackish marsh	Fresh to Slightly brackish marsh	Coastal Scrub/upland/ruderal	Brewer's rush dunes	
Channel Excavation	20.95	0.20	0.00	0.03	0.00	0.00	0.00	21.18
Levee Breach	0.19	0.14	0.00	0.13	0.00	0.04	0.00	0.50
Levee Lowering	0.57	1.78	0.00	8.16	0.00	0.01	0.00	10.52
Levee Removal	0.00	0.65	0.20	0.95	0.00	1.06	0.00	2.66
Habitat Fill	0.00	18.44	0.00	26.51	0.00	0.51	0.00	45.46
Habitat Ridge	0.03	0.89	0.00	0.16	0.00	0.00	0.00	1.08
Ditch Block	0.02	0.08	0.00	0.16	0.00	0.00	0.00	0.26
Large Wood	0.06	0.35	0.00	0.03	0.00	0.00	0.00	0.44
Total	21.82	22.53	0.20	36.13	0.00	1.62	0.00	82.10

To evaluate potential shifts in aquatic resource types after the Project is implemented, existing ground elevation data (AECOM 2019) and mapped wetland types (Pacific Coast Restoration 2018a) were used to estimate the range of elevations typical of each aquatic resource type within the Project Area (Table 3.4-6) (GHD 2019). The elevations displayed in Table 3.4-6 and associated with each aquatic resource type is based upon existing conditions in Area A, which is already at nearly a full tidal exchange and is not expected to significantly change in tidal amplitude following Project implementation. These estimated elevation ranges were then compared to the results of the Project hydraulic model (AECOM 2019), which simulated maximum (mean higher high water [MHHW]) and minimum (mean lower low water [MLLW]) water levels over a 14-day tidal period.¹ Anticipated changes in water level tidal datums and ranges derived from the model were used to evaluate if the Project would likely result in a change in the existing vegetation community, or a shift in the aquatic resource type.

Figure 3.4-6 depicts the anticipated aquatic resource types following Project implementation, using the corresponding elevation ranges presented in Table 3.4-6 and the tidal amplitude results of the hydraulic model from AECOM (2019). Based upon the Project hydraulic model, it is assumed that aquatic resource types above eight feet (2.4 meters) in elevation would remain the same as pre-Project conditions. Therefore, the post-Project aquatic resource types above eight feet (2.4 meters) are displayed on Figure 3.4-6 using pre-Project aquatic resource type data shown in Figure 3.4-1 (Existing Aquatic Resources).

Table 3.4-6 Aquatic Resource Types by Elevation Range Based on Management Unit A

Aquatic Resource Type	Elevation Range (ft) (NAVD88 datum)
Subtidal channel	< 2.5
Intertidal channel/mudflat	2.5 - 4.9
Coastal salt and brackish marsh	4.9 - 8.0
Freshwater to slightly brackish marsh	> 8.0
Freshwater shrub wetlands	
Brewer's rush dunes	
Ruderal (facultative)	

Notes: The elevation associated with coastal salt and brackish marsh and freshwater to slightly brackish marsh overlapped from approximately six to eight feet (1.8 to 2.4 meters), i.e. both resource types were recorded within

¹ See Table A-2 in AECOM (2019) for a summary comparison of water level tidal datums and ranges within and adjacent to the Project Area under current and proposed conditions.

the six to eight feet elevation range. For this analysis, a conservative approach was used to assume that any freshwater to slightly brackish marsh aquatic resource type below eight feet (2.4 meters) would convert to coastal salt to brackish marsh because there is no way to predict which wetlands under eight feet would remain fresh or would convert to salt to brackish marsh. Additionally, the freshwater dominant aquatic resource types overlapped at varying degrees at elevations higher than eight feet. For this analysis, existing aquatic resource types at elevations higher than eight feet were assumed to remain the same as displayed in Figure 3.4-1 (Existing Aquatic Resources).

The change in tidal amplitude after the Project is implemented would have minimal impact on vegetation communities in Areas A, D, and E. These areas are either already subject to the full tidal range (Area A) or are located at ground surface elevations where changes in tidal elevations would not significantly impact the vegetative communities (Areas D and E). The primary shift in aquatic resource types in these areas would be associated with locations where tidal channels would be located and designed to remain inundated even at the lowest of tides. The proposed change in tidal amplitude would, however, likely transition portions of Area B (which is currently muted tidal marsh) to have additional coastal salt and brackish marsh and reduce the extent of intertidal mudflat (see Table 3.4-7).

Table 3.4-7 Extent of Coastal Salt and Brackish Marsh and Intertidal Mudflat by Management Area – Existing and Proposed (Acres)

Management Area	Coastal Salt and Brackish Marsh			Intertidal Mudflat		
	Existing Conditions	Proposed	Difference	Existing Conditions	Proposed	Difference
A	199.1	211.5	12.4	65.5	50.5	-15.0
B	24.6	49.5	24.9	69.7	48.7	-21.0
C	13.1	17.6	4.5	9.9	14.5	4.6
D	3.2	4.0	0.8	0.3	0.1	-0.2
E	2.2	4.6	2.4	0.9	0.2	-0.7

Overall, it is anticipated that the total acreage of subtidal channel and coastal salt and brackish marsh within the Project Area would increase slightly after the Project is implemented, and that the acreages of intertidal mudflat, freshwater to slightly brackish marsh, Brewer's rush dunes, freshwater shrub wetland, ruderal (facultative) and freshwater pond would decrease (Table 3.4-8).

Table 3.4-8 Aquatic Resource Types Before and After Project Implementation

Aquatic Resource Type	Existing (Acres)	Proposed (acres)	Net Gain or Loss
Wetlands			
Coastal salt and brackish marsh	306.5	347.0	40.5
Fresh to slightly brackish marsh	36.9	12.9	-24.0
Freshwater shrub wetland	6.9	5.2	-1.7
Brewer's rush dunes	33.4	27.7	-5.7
Ruderal (facultative)	7.4	6.5	-0.9
Other Waters of the U.S./State			
Subtidal channel	11.7	36.1	24.4
Intertidal channel/mudflat	161.9	129.5	-32.4
Freshwater Pond	0.20	0.0	-0.2
Total	564.9	564.9	

As described above, the changes are attributed to excavation and fill activities that would occur due to construction of the Project, and changes in the tidal amplitude associated with restoring tidal flows to the Project Area. These changes in aquatic resource type are not deemed a significant impact because they represent a shift from a degraded and disconnected muted tidal system, to a fully functioning and interconnected estuarine system, with an improved tidal prism and overall habitat quality for estuarine dependent fish and wildlife. Potential temporary and short-term impacts associated with the use of construction equipment in or near aquatic resources would be reduced through implementation of Mitigation Measure BIO-3.

Mitigation Measure: Implement Mitigation Measure BIO-3.

Mitigation Measure BIO-3: Mitigate Temporary and Short-term Impacts to Aquatic Resources Through Construction Minimization and Avoidance Measures

The following measures will be implemented to avoid and minimize impacts to aquatic resources during construction, or when heavy equipment is proposed for use in aquatic resources:

- With the exception of Area A (which is fully tidal), work areas will be isolated prior to ground disturbance to avoid delivery of sediment to downstream waters. To the extent possible, construction will occur when the work area has been dry or dewatered. Within Area A, adverse impacts on water quality will be minimized by installing restoration elements at low tide and using amphibious or low ground pressure equipment in fully tidal areas.
- Site disturbance shall be minimized to the greatest extent feasible by using existing disturbed areas for access and staging 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.

- Contractors shall sign a document stating that they have read, understand, and agree to the required resource avoidance measures, and shall have construction/invasive plant management crews participate in a training session on avoiding and minimizing impacts to wetlands.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure BIO-3 would reduce the impact of Project construction activities on aquatic resources to a less-than-significant level by isolating work areas; utilizing existing disturbed areas for access roads and staging as much as feasibly possible, and ensuring the contractor is aware of aquatic resources to be avoided.

Invasive Plant Management

Invasive plant management activities could also directly impact aquatic resource areas targeted for treatment. Specifically, up to 571 acres (231 hectares) of dense-flowered cordgrass occurs in areas delineated as aquatic resources, and would be targeted for removal using mowing, excavation, prescribed burning, and herbicide application under the Project. Similarly, removal of dwarf eelgrass would occur in McNulty Slough, as needed, which could temporarily impact water quality in/around removal sites. Proposed treatments of European beachgrass would not substantially occur in aquatic resources, however the western fringe of Brewer's rush dunes may be affected by invasive plant management treatments in the dunes.

By design, removal of invasive aquatic plants would impact wetland vegetation community structure and habitat suitability for certain plants. The implementation of Mitigation Measure BIO-3 would reduce any short-term impacts to wetlands during invasive plant management activities that utilize heavy equipment and occur in aquatic resources. As a result, this impact would be less than significant with mitigation.

Mitigation Measures: Implement Mitigation Measure BIO-3.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure BIO-3 would reduce the impact of invasive plant management activities that utilize heavy equipment on aquatic resources to a less-than-significant level by isolating work areas, utilizing existing disturbed areas for access roads and staging as much as feasibly possible, and ensuring the contractor implementing invasive plant management activities is aware of aquatic resources to be avoided.

Maintenance

Maintenance activities, including litter removal and general management of the trails, the non-motorized boat put-in, signage and the parking lot, would occur within the footprint of the areas to be maintained. With the exception of the non-motorized boat put-in, these areas would be disturbed and would not contain wetlands or other aquatic resources that would need to be avoided. Any cleaning and maintenance of the non-motorized boat put-in would be completed within the footprint of the

proposed infrastructure and would not cause deterioration to surrounding wetlands or aquatic resources. Monitoring activities would be conducted on foot and would be as minimally invasive as possible to document post-Project conditions. A less than significant impact would occur.

Impact BIO-4: Would the Project 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?

One of the primary goals of the Project is to improve the tidal prism and restore the marsh's function as an estuary, which is expected to increase the accessibility of the area to salmonids and other aquatic species. Currently, existing infrastructure (berms, water control structures) and seasonal or other periodic barriers block the movement of fish and other aquatic species within the Project Area. Thus, there would be a net gain in the area of accessible habitat and potential for movement of salmonids, Tidewater Goby and other aquatic species following Project implementation.

However, there may be some temporary interference with movement of aquatic species during construction while silt fences are in place and during in water construction. 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. Additionally, Mitigation Measure BIO-1a requires that all in-water portions of construction, invasive plant management and maintenance activities take place during the dry-season work window (May through October) to avoid the most vulnerable life stages of sensitive fish species that occur in the study area.

The Project may also temporarily interfere with movement of terrestrial species, such as migratory birds through trimming or removal of vegetation onsite, and resident Western Snowy Plover through removal of European beachgrass. However, with implementation of Mitigation Measures BIO-1b and BIO-1c, surveys would be conducted and work windows implemented if Project activities were to take place within the nesting season for migratory birds, and Western Snowy Plover, respectively. In general, the effect on fish and wildlife species movement from Project construction, invasive plant management, and maintenance activities would be temporary and reduced through implementation of construction-related Mitigation Measures.

Mitigation Measures: Implement Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-1d.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measures BIO-1a, BIO-1b, BIO-1c, and BIO-1d would reduce potential impacts to the movement of fish and wildlife species during construction and invasive plant management activities to a less-than-significant level.

Impact BIO-5: Would the Project conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance?

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the SLC, and therefore would not require adherence to the Humboldt County General Plan or compliance with local policies or ordinances. The Project is subject to the Coastal Act; the policies within the Coastal Act that pertain to biological resources include the following:

California Coastal Act

Sections of the Coastal Act that pertain to protection of biological resources include Sections 30240 and 30233 of the Coastal Act. Section 30240 states that environmentally sensitive habitat areas shall be protected from a significant disruption in habitat values, and Section 30233 discusses allowable uses of fill in coastal wetlands. Although no wetlands would be converted to uplands as a result of the Project, restoration is one of the allowable uses for placing fill in coastal wetlands.

The following mitigation measures address and reduce impacts to sensitive species and habitats where feasible:

- Mitigation Measures BIO-1a (Avoidance and Minimization Measures for Fish and other Aquatic Species)
- Mitigation Measure HHM-2 (Accidents Associated with Release of Chemicals and Motor Fuel)
- Mitigation Measure HHM-4 (Avoid Health Effects to the Public and Environment from Herbicide)
- Mitigation Measure WQ-1 (Managed Herbicide Control)
- Mitigation Measure WQ-2 (Minimize Herbicide Spill Risks)
- Mitigation Measure BIO-1b (Conduct Pre-construction Nest Surveys for Ground Nesting Special-status and Migratory Avian Species)
- Mitigation Measure BIO-1c (Avoid and Minimize Potential Impacts to Western Snowy Plover)
- Mitigation Measure BIO-1d (Avoid, and Minimize Potential Impacts to Northern Red-legged Frog and Northwestern Pond Turtles)
- Mitigation Measure BIO-1e (Minimize Impacts to Special-status Plant Species found in Tidal Marsh),
- Mitigation Measure BIO-1f (Avoidance and Minimization of Special-status Plant Species during Prescribed Burns)
- Mitigation Measure BIO-3 (Mitigate Temporary and Short-term Impacts to Aquatic Resources Through Construction Minimization and Avoidance Measures).

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant with mitigation.

With implementation of the mitigation measures listed above, the Project would not conflict with local plan or ordinances for the protection of biological resources. A less than significant impact would occur.

3.4.6 Cumulative Impacts

Impact BIO-C-1: Would the Project contribute to a cumulatively significant impact to biological resources?

Many of the projects identified in Table 3-1 (Projects Considered for Cumulative Impacts) are ecological enhancement or restoration projects and infrastructure improvement projects which could result in impacts to sensitive biological resources, including special-status species, wetlands, and Sensitive Natural Communities (and therefore ESHA). However, these potential impacts would be temporary, and would be mitigated through avoidance measures, BMPs, and long-term ecological benefits. Implementation of the Project discussed in this Draft EIR would ultimately enhance the habitat value of the Eel River estuary by increasing the amount of tidally inundated habitat managed for native fish, plants, and wildlife, and improving resilience to future habitat disturbances such as sea level rise. The proposed Project upholds goals from the following recovery plans:

- Recovery Plan for the Tidewater Goby (*Eucyclogobius newberryi*) (USFWS 2005)
- Southern Oregon/Northern California Coast (SONCC) Coho Salmon Recovery Plan (NMFS 2014b)
- Final Coastal Multispecies Recovery Plan, California Coastal Chinook Salmon (volume 2), Northern California Steelhead (volume 3) (NMFS 2016)
- Recovery Strategy for California Coho Salmon (CDFG 2004)
- Updated Statewide 2013 Task List for the Steelhead Trout Restoration and Management Plan for California (DFG 1996) (CDFW 2013)
- Recovery Plan for Seven Coastal Plants and the Myrtle's Silverspot Butterfly (USFWS 1998), including beach layia
- Recovery Plan for the Pacific Coast Population of the Western Snowy Plover (*Charadrius alexandrinus nivosus*) (USFWS 2007)
- California Bird Species of Special Concern: A Ranked Assessment of Species, Subspecies and Distinct Populations of Birds of Immediate Conservation Concern in California (Shuford and Gardall 2008)
- West Coast Governors' Agreement on Ocean Health Action Plan (Office of the Governors – Washington, Oregon, California 2008)

Construction at the Salt River Ecosystem Restoration Project, located near the Project Area, is mostly completed at the downstream end (e.g., closest to the Eel River mouth). Tidewater Goby are known to use habitat in Riverside Ranch and in the Eel River Estuary Preserve, located upstream and south, respectively, of the proposed Project. Juvenile salmonids and Longfin Smelt are known to use the Salt River, located upstream of the Project, and Eel River estuary. Impacts of construction and invasive plant management from within the Project Area are

unlikely to cumulatively impact aquatic species analyzed in this Draft EIR - including Tidewater Goby, juvenile Salmonids, Longfin Smelt, Eulachon, Green Sturgeon and Pacific Lamprey - because there is suitable regional habitat for these species to utilize should numerous projects take place concurrently. Potential impacts would be mitigated through avoidance measures and BMPs including implementation of mitigation measures, such as Mitigation Measure BIO-1a (Avoidance, Minimization, and Mitigation for Fish and other Aquatic Species). Implementation of the proposed Project would expand estuarine habitat and provide access and connectivity between freshwater and brackish habitat (such as in Area E).

In addition, the Project includes invasive plant management activities that would significantly improve plant habitat in the tidal marsh and along the dunes through the strategic treatment and removal of two invasive plants: dense-flowered cordgrass and European beachgrass. Some projects listed on Table 3-1 include an invasive plant management component, and have either been completed or are in the planning phase, such as the Salt River Ecosystem Restoration Project, Cannibal Island Restoration Study Area, Eel River Estuary and Centerville Slough Enhancement Project, and the Wetland Reserve Program or Floodplain Easement Projects. Soil may become more erosive during mechanical or manual invasive plant removal, which could become mobilized within the water column and a cumulative adverse impact on water quality or aquatic species could occur due to increased sedimentation in the Eel River or tributaries. Construction of each project could result in short-term impacts to sensitive biological resources, however these impacts would be mitigated through avoidance measures and BMPs. Overall, the benefits of invasive plant removal substantially outweigh potential and temporary impacts to biological resources due to the anticipated long-lasting improvement to the Project Area's ecological functions and the increased abundance and distribution of numerous State and Federally-listed, and otherwise sensitive species. Cumulative biological impacts would be less than significant with implementation of the mitigation measures presented in this Draft EIR.

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant.

3.4.7 References

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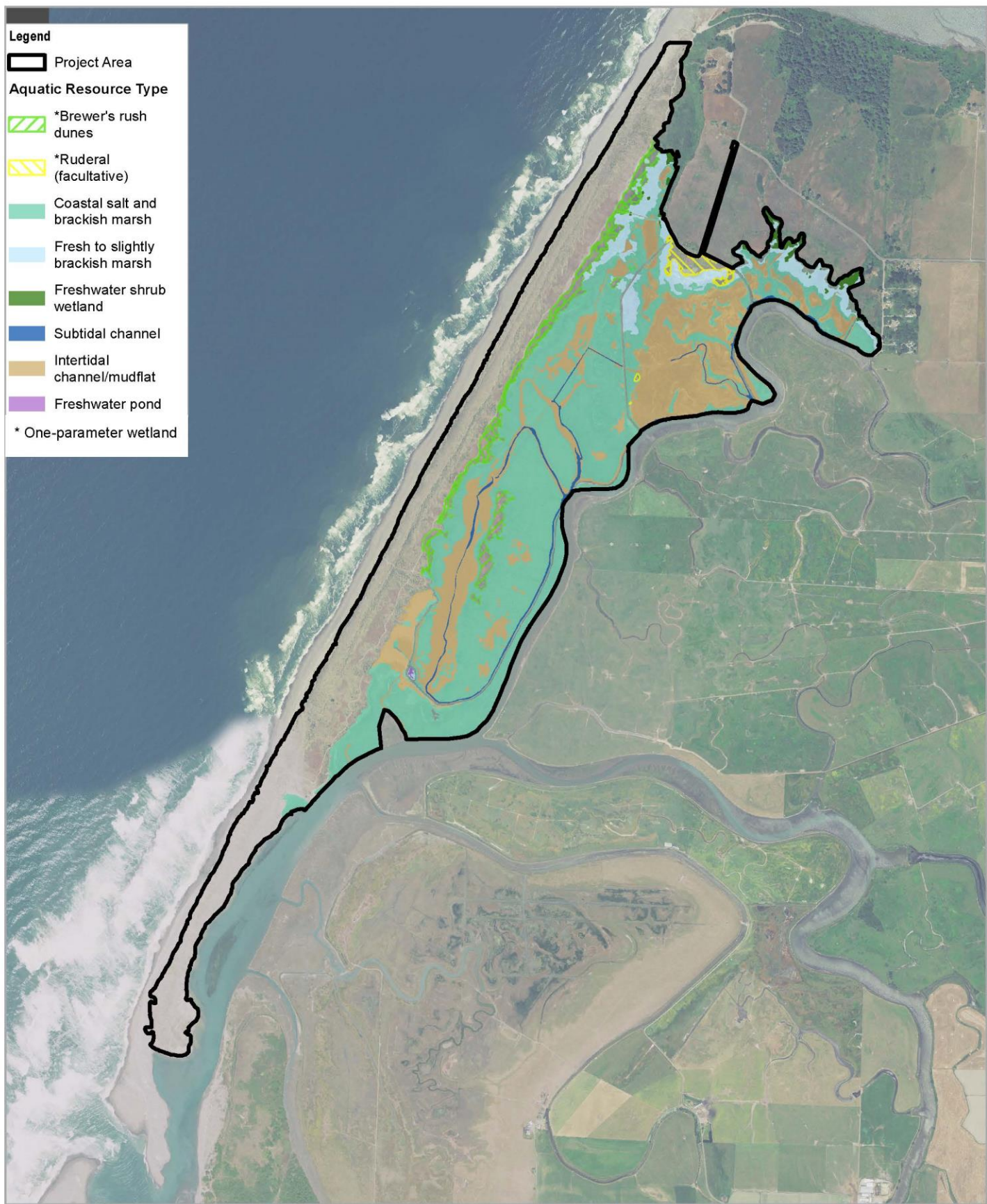
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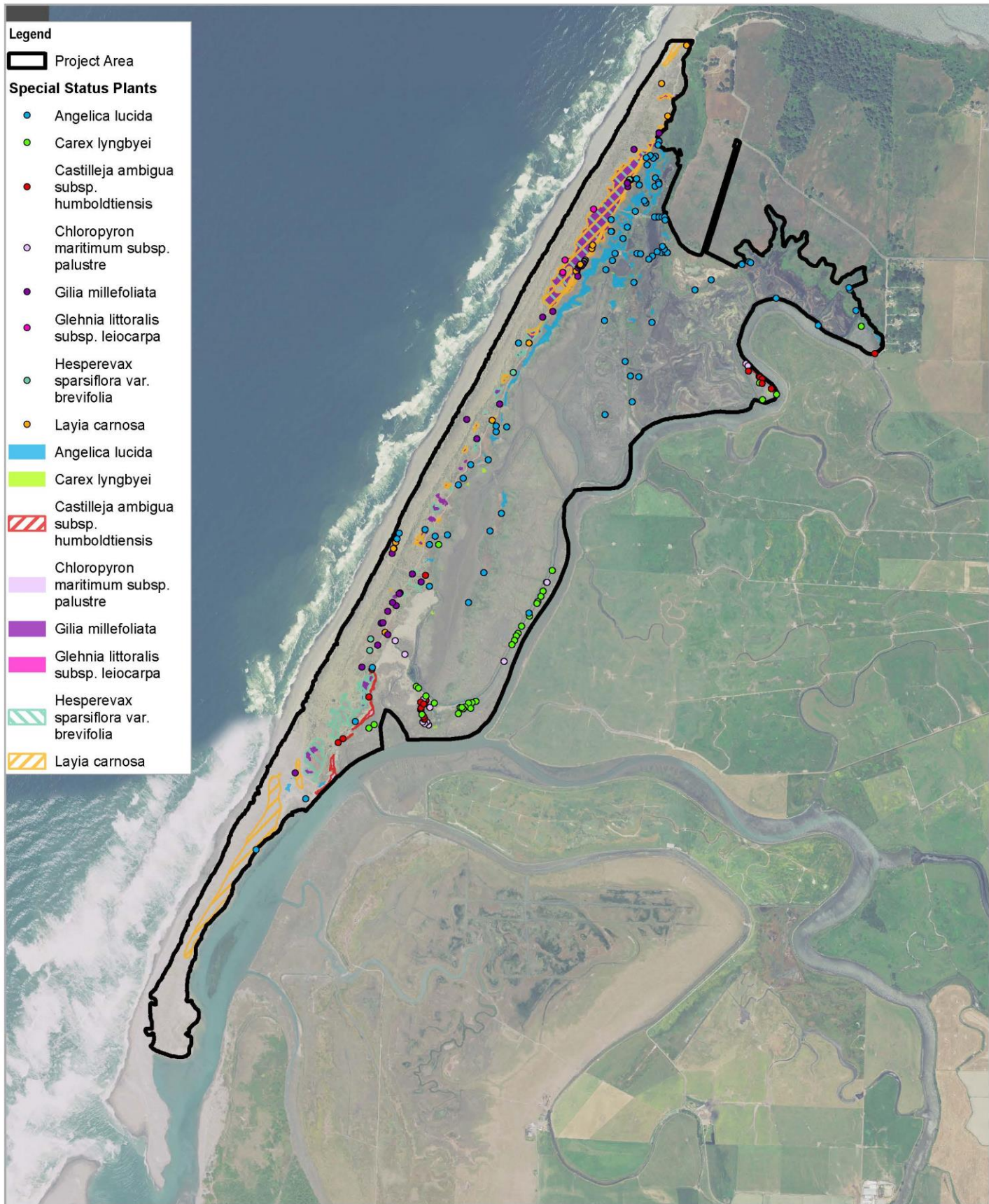
California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/16/2020

Map Projection: Lambert Conformal Conic
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Existing Aquatic Resources

FIGURE 3.4-1



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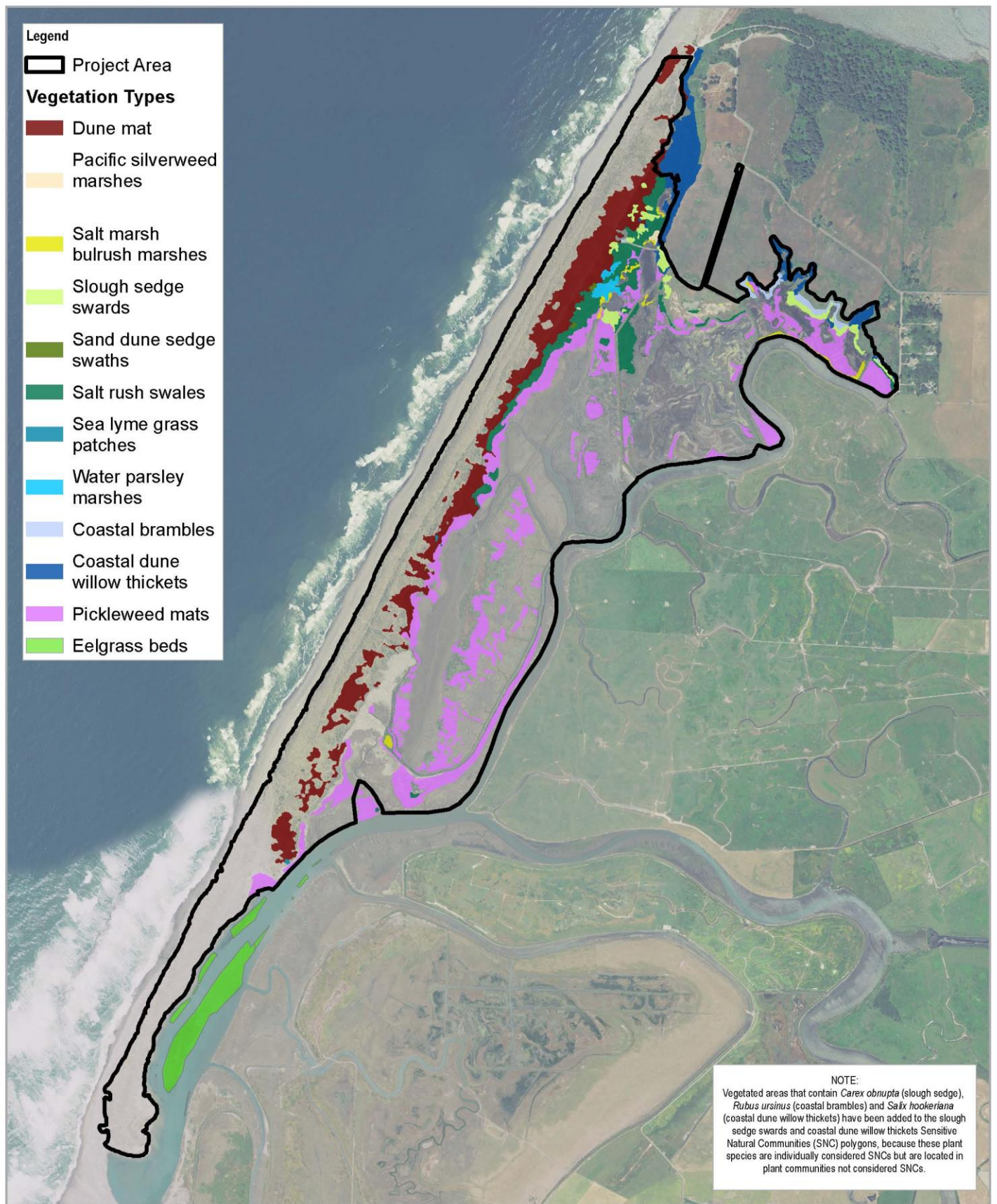
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Rare Plant Mapping

FIGURE 3.4-2



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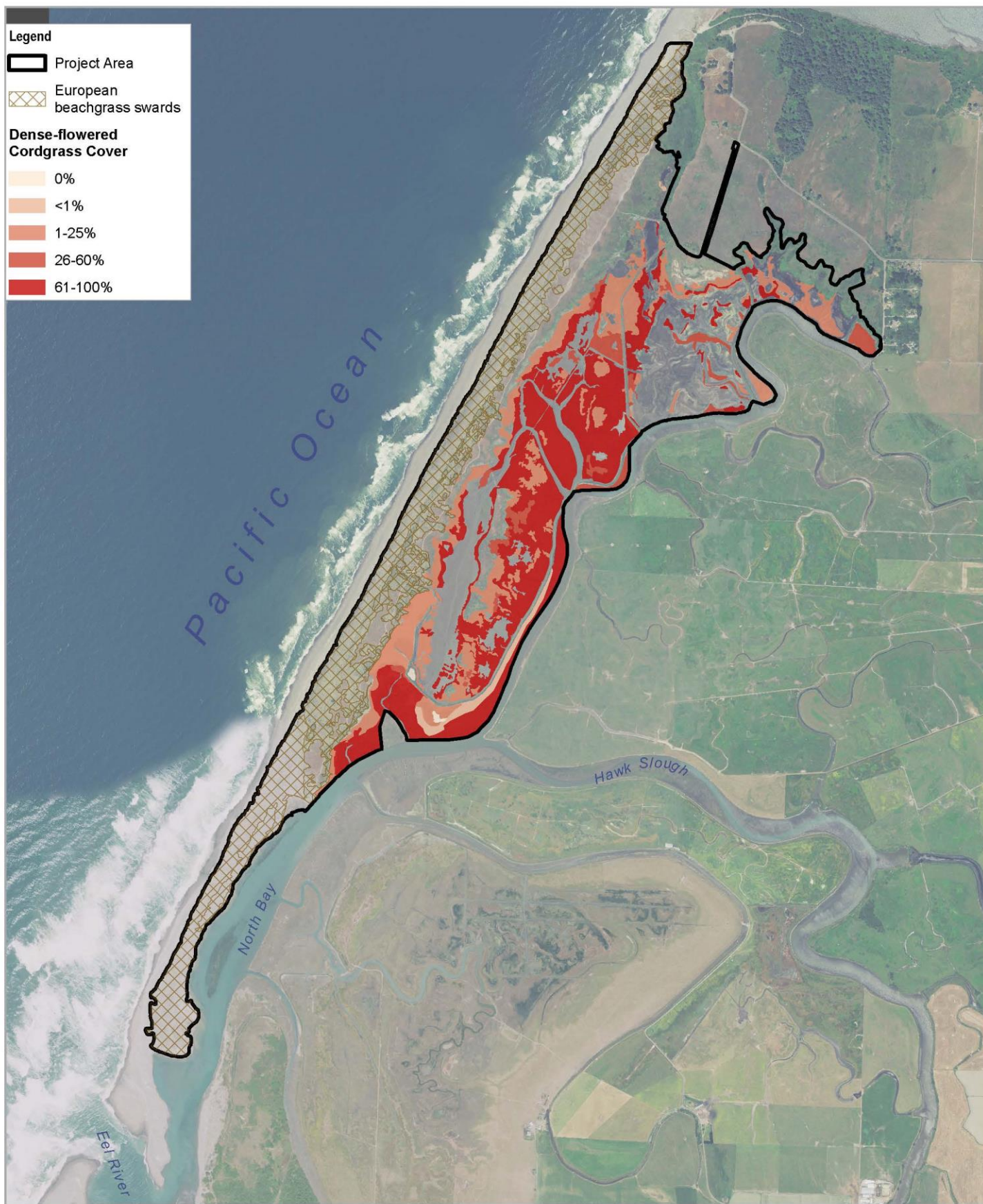
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Sensitive Natural Communities

FIGURE 3.4-3



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Revision No. -
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Invasive Plant Communities

FIGURE 3.4-4



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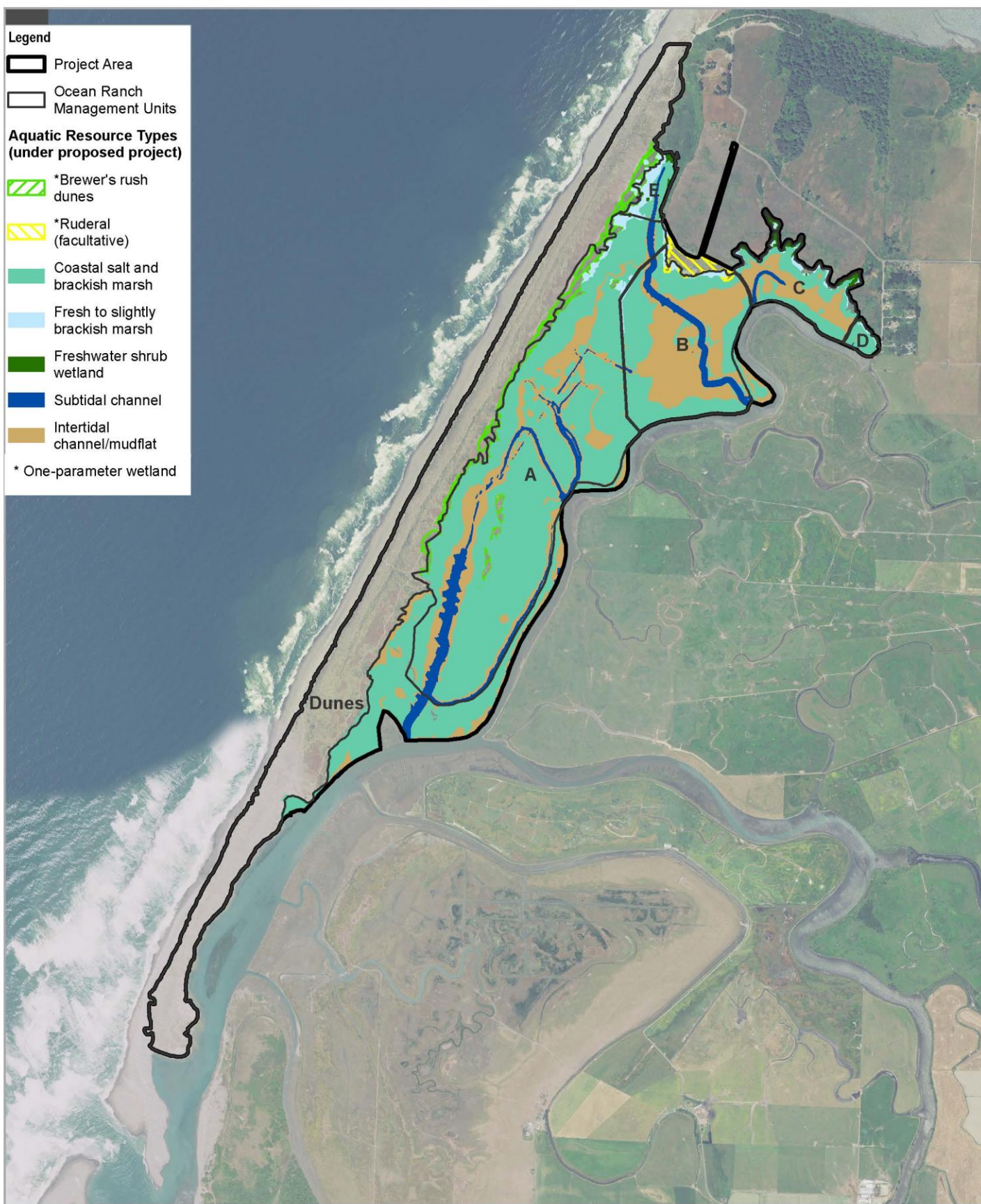
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Ocean Ranch Restoration Project

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Revision No. -
Date 6/25/2020

Map Projection: Lambert Conformal Conic
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**Critical Habitat for
Western Snowy Plover**

FIGURE 3.4-5



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Ocean Ranch Restoration Project

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Date 6/16/2020

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Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California I FIPS 0401 Feet

Anticipated Aquatic Resources
After Project Implementation

FIGURE 3.4-6

3.5 Cultural Resources

This section evaluates potential impacts on cultural resources from construction, invasive plant management and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lot and road within the Project Area, and also include monitoring activities. For the purposes of this section, cultural resources include prehistoric or historic archaeological sites, structures, or objects. Refer to Section 3.15 (Tribal Cultural Resources) for a discussion of tribal cultural resources, or resources that are of specific concern to California Native American tribes, and where knowledge of such resources is limited to tribal people. Refer to Section 3.6 (Geology and Soils) for a discussion of paleontological resources. For the purpose of this section, the study area for cultural resources is the same as the Project Area.

3.5.1 Setting

This Section is largely based on a *Historic Resources Study* prepared for the Project by Origer & Associates (Origer & Associates 2017).

Prehistoric Context

The study 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 (Roscoe and Associates 2016). The Yuroks then came “at a much later date,” sometime subsequent to the arrival of the first Athabascan speakers, who came after 600 Common Era (CE) (Roscoe and Associates 2016).

The Wiyot lived almost exclusively in villages along the protected shores of Humboldt Bay and near the mouths of the Eel and Mad Rivers. They were hunter-gatherers in rich environments that allowed for dense populations. They settled in large, permanent villages about which were distributed seasonal camps and task-specific sites. Primary villages were inhabited throughout the year while other sites were visited seasonally to obtain particular resources (Origer & Associates 2017).

Historic Context

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. This Euro-American settlement notably changed the natural systems in the Eel River Delta, with reclamation projects converting marshes to agricultural land for cultivated crops, dairying, and ranching.

Records and Literature Search

The background research for this Project included archival research of the library and project files at Origer & Associates as well as a search through the California Historical Resources Information System (CHRIS). Sources of information included but were not limited to the current listings of properties in the National Register of Historic Places (NRHP), California Historical Landmarks, California Register of Historical Resources (CRHR), and California Points of Historical Interest as listed in the Office of Historic Preservation's *Historic Property Directory*. The CHRIS records search included an examination of archaeological site records, base maps, survey reports, and project files at the Northwest Information Center (NWIC). In addition to the private library and NWIC record search, ethnographic literature that describes appropriate Native American groups, county histories and other primary and secondary sources were reviewed.

The records search at the NWIC revealed that several studies have taken place within the study area (Grangaard 2002; Van Kirk 1998; Warnock 1987), and one additional study had been conducted within a half-mile of the study area (Raskin and Roscoe 2008).

One recorded cultural resource has been identified within the study area. The recorded site, referred to as the *Welap* site (P-12-000170), is a Wiyot archaeological site discovered by Loud in 1918. There is little information about this site in Loud (1918), but it is likely it was used as a dwelling place by Wiyot people before the turn-of-the-century (Origer & Associates 2017).

Three additional resources are recorded within a half mile of the study area. One of these, the Ocean Ranch Complex (P-12-003452), includes three barns, a house, and several associated outbuildings discovered by Grangaard and Jorgenson in 2002. The Ocean Ranch Complex does not extend into the study area.

In addition to recorded resources, a review of 20th century maps show additional buildings located within the study area. Specifically, the 1929 United States Coast & Geodetic Survey (USC&GS) map of False Cape to Table Bluff, California indicates that there were four buildings (possibly a farm complex) within the study area. The 1919 USACE map shows no buildings at this location, and the 1940 aerial photograph and the 1959 USGS map also show no buildings at this location, which suggests that this building complex may have existed for approximately 25 years at most. This potential feature is known as the "1929 USC&GS Complex" (Origer & Associates 2017).

Native American Contact

Origer & Associates initiated contact with the Native American Heritage Commission (NAHC) on October 26, 2017 requesting information on any known sacred lands or other cultural sites that may be present within the study area (Origer & Associates. 2017). Origer & Associates also sent letters to representatives of the Bear River Band of Rohnerville Rancheria and of the Wiyot Tribe on November 7, 2017. No

response from the NAHC, the Bear River Band of Rohnerville Rancheria, or the Wiyot Tribe has been received to date.

Formal consultation for this Project was also initiated between the lead agency (CDFW) and California Native American tribes culturally affiliated with the study area pursuant to CEQA and Public Resources Code (PRC) Section 21080.3.1, as well as CDFW's Tribal Communication and Consultation Policy. Specifically, on July 26, 2018, CDFW notified ten individuals representing seven Native American tribes in writing. The letters included a thorough description of the Project and invited tribes to provide information or concerns specific to the study area generally or Project specifically. A response was received from the Cher-Ae Heights Indian Community of the Trinidad Rancheria on August 23, 2018 stating that the study area is outside the geographical area of concern for the Trinidad Rancheria. No other responses have been received to date, and no tribes requested formal consultation for the Project.

Field Survey

An archaeological field reconnaissance survey of the Project Area was conducted by Origer & Associates on November 9, 10, and 11, 2017. The field survey was designed to suit the study area's sensitivity for the occurrence of prehistoric and historic cultural resources based on pre-field research. Prehistoric archaeological site indicators expected to be found in the region include but are not limited to: obsidian and chert flakes and chipped stone tools; grinding and mashing implements such as slabs and hand stones and mortars and pestles; and locally darkened midden soils containing some of the previously listed items plus fragments of bone, shellfish, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits.

The study area was surveyed in transects with corridors spaced 15 to 20 meters apart. Ground visibility ranged from good to poor, with vegetation such as European beachgrass, blackberry vine, and cordgrass being the primary hindrances. Hoes were used, as needed, to clear patches so that the ground surface could be inspected. In addition to the vegetation, water was a major hindrance. Several areas within the study area were heavily inundated, making an intensive survey of these areas impossible. In these areas, a mixed-strategy survey method was incorporated. Special attention was paid to flatter areas and areas without excessive flooding where the ground surface could be inspected.

Inventory Results

During the field investigation, locations of remnant and standing buildings and building complexes were identified. The areas in which the Welapl site (P-12-000170) were plotted by the NWIC and Loud (1918) were inspected, but no archaeological evidence was found of this archaeological site. The area on the 1929 USC&GS map where four buildings are shown was also carefully inspected in the field. No evidence of any buildings or land uses (e.g., lumber, foundations, archaeological specimens) was identified. A north-south trending barbed wire fence with modern peeler poles and T-posts, a cement water trough, and a short possible power pole are present. At low tide, the remains of a gravel road and a concrete

culvert can be seen leading from the sand dunes to the west toward the site location (Origer & Associates 2017).

The Ocean Ranch Complex, located outside of the study area to the north, was also reviewed in the field. For informational purposes, the northern location within the Ocean Ranch Complex consists of the ruins of the Ocean Ranch House, Barn 1, Barn 2, a pump house and the surrounding area. The southern location consists of the possible garage/shed (standing), the corrals and livestock chute (standing), the location of Barn 3, and milk barns. The southern location is adjacent to the Project Area (north of Area B) near where the parking lot is proposed. No historic resources were found at this location (Origer & Associates 2017) and proposed Project activities would not modify existing infrastructure in this location. The Ocean Ranch Complex is not discussed further as it is not located within the study area and would not be affected by the Project.

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) and is funded in part by federal grant money administered by the National Oceanic and Atmospheric Administration (NOAA) Restoration Center. Section 106 of the National Historic Preservation Act (NHPA) requires that, before beginning an undertaking, a federal agency, or projects that require a federal permit or utilize federal funds, 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 Code of Federal Regulations (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 resource 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 statute.

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, 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 (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 [CCR] Title 14, 15064.5). The following steps are normally taken in a cultural resources investigation to comply with CEQA:

- Identify cultural resources within a study area
- 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 Coastal Act

The Project Area is within the Coastal Zone. The California Coastal Act (Coastal Act) contains policies relevant to cultural resources. The following Coastal Act sections are relevant to this analysis:

Public Resources Code Section 30116 Sensitive coastal resource areas

“Sensitive coastal resource areas” means those identifiable and geographically bounded lands and water areas within the coastal zone of vital interest and sensitivity. “Sensitive coastal resource areas” include the following:

(d) Archaeological sites referenced in the California Coastline and Recreation Plan or as designated by the State Historic Preservation Officer.

Public Resources Code Section 30244 Archaeological or paleontological resources

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

State Lands Commission

The State Lands Commission (SLC) has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways. All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine. The title to all archaeological sites and historic or cultural resources on or in the tide and submerged lands of California is vested in the state and under the jurisdiction of the SLC.

Office of Historic Preservation

The California State Office of Historic Preservation (OHP) is responsible for administering federally and state mandated historic preservation programs to further the identification, evaluation, registration and protection of California’s irreplaceable archaeological and historical resources under the direction of the State Historic Preservation Officer and the State Historical Resources Commission.

OHP reviews and comments on federally sponsored projects pursuant to NHPA Section 106, and state programs pursuant to PRC Sections 5024 and 5024.5, which provide policies and plans for preserving and maintaining all state-owned historical resources or eligible historical resources. OHP also reviews and comments on local government and state projects pursuant to CEQA.

A variety of programs have been created by OHP in order to manage historic resources and to determine eligibility for classification as a historic resource. The programs that OHP administer includes: the NRHP, the CRHR, the California Historical Landmarks, and the California Points of Historical Interest. Each program has different eligibility criteria and procedural requirements; the eligibility criteria listed through the NRHP (mentioned above) and CRHR (mentioned below) are used to evaluate significance of potential cultural resources within this Project.

California Register of Historic Resources

Cultural resource significance is evaluated in terms of eligibility for listing in the CRHR. The State Historical Resources Commission has designed the CRHR program for use by state and local agencies, private groups and citizens to identify,

evaluate, register and protect California's historical resources. The CRHR is the authoritative guide to the state's significant historical and archaeological resources. Criteria for listing a resource in the CRHR include:

- Criterion 1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States.
- Criterion 2. Associated with the lives of persons important to local, California or national history.
- Criterion 3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values.
- Criterion 4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

The CRHR criteria is nearly identical to the federal NRHP criteria, and are used in tandem as "1/A" or "2/B" when identifying impacts in Section 3.5.5 (Impacts and Mitigation Measures). There is a slight difference in meaning between the CRHR and NRHP regarding Criterion 3 (Criterion C in the NRHP), which will be accounted when determining impacts and significance in Section 3.5.5 (Impacts and Mitigation Measures).

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 resources.

Several sections of the PRC protect cultural resources. Under Section 5097.5, no person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface, any historic ruins, burial grounds, archaeological site, inscriptions made by humans, rock art, or any other archaeological, 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 (MLD) 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. See Section 3.15 (Tribal Cultural Resources) for more information on AB 52 compliance and tribal cultural resources.

California Health and Safety Code

California Health and Safety Code (HSC) 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

Lands within the study area are owned by CDFW or are under the jurisdiction of the SLC, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential impacts related to cultural resources would be limited to the study area, local and regional regulatory policies are not included in this analysis.

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 adverse change in the significance of a historical resource pursuant to Section 15064.5;
- Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5; or
- Disturb any human remains, including those interred outside of formal cemeteries.

3.5.4 Methodology

The evaluation of potential impacts on cultural resources is based on the potential for ground disturbance during construction and maintenance activities to disturb or destroy known or previously unrecorded cultural resources. The impact analysis included in this section is largely based on the *Historic Resources Study* prepared for the Project by Origer & Associates (2017), and consultations with California Native American tribes traditionally and culturally affiliated with the geographic area of the Project.

3.5.5 Impacts and Mitigation Measures

Impact CR-1: Would the Project cause a substantial adverse change in the significance of a historical or archaeological resource pursuant to Section 15064.5?

As described in Section 3.5.1, one archaeological site (Welapl) and one potential historical complex (the 1929 USC&GS Complex) are located in the study area. Welapl is an archaeological site that was recorded by Loud in 1918, and is described as a site that was “not used by the turn of the century Wiyot as dwelling places.” The 1929 USC&GS Complex is a complex within the Project Area where four buildings are believed to have existed between 1919 and 1940.

The historical significance of both sites was assessed by Origer and Associates (2017) using state and federal criteria provided by the CRHR and NRHP (see Section 3.5.2). As summarized in Table 3.5-1, both Welapl and the 1929 USC&GS Complex may be significant under Criterion 4/D as resources that have or may have archaeological value. They would not be considered significant under Criterion 1/A, 2/B, or 3/C.

Table 3.5-1 Identified Cultural Resources Compared to NRHP and CRHR Eligibility Criteria

Feature	Criterion 1/A – Broad Patterns of History	Criterion 2/B – Broad Patterns of Important People	Criterion 3/C – Notable Examples of the Built Environment	Criterion 4/D – Have or May Have Archaeological Value
Welapl	Not Significant	Not Significant	Not Significant	Potentially Significant
1929 USC&GS Complex	Not Significant	Not Significant	Not Significant	Potentially Significant

The Welapl site and the 1929 USC&GS Complex do not meet Criterion 1/A because there is nothing to suggest that any of the features were associated with events that made a significant contribution to regional or local history. The Welapl site and the 1929 USC&GS Complex do not meet Criterion 2/B because there is nothing to suggest the locations are associated with the lives of persons important to local, California, or national history. The Welapl site and the 1929 USC&GS site do not meet Criterion 3/C because neither site has distinctive characteristics; the Welapl site is described as “neither occupied nor named by recent Wiyot” in Loud (1918), and no evidence of any buildings or land uses (e.g., lumber, foundations, archaeological specimens) were found at the 1929 USC&GS Complex, outside of the remains of a gravel road and a concrete culvert in the vicinity of the site. The Welapl site could be significant under Criterion 4/D, though no evidence of an archaeological site was found during the field survey. Similarly, the 1929 USC&GS

Complex could be significant under Criterion 4/D, as map evidence indicates that buried artifacts and features from a short occupation could mark this location.

Project activities that would take place in the areas where the Welapl site and the 1929 USC&GS Complex are believed to be located include invasive plant management with a focus on eradicating dense-flowered cordgrass. As noted above, an archaeological field reconnaissance survey of the plotted areas did not identify archaeological evidence at either site. However, if the Welapl site or 1929 USC&GS Complex are encountered during Project activities, a significant impact could occur.

In addition, it is possible that additional unrecognized surficial resources or subsurface archaeological deposits are present within the study area. If as-of-yet unknown archaeological materials that qualify as a historical resource or unique archaeological resource as defined by CEQA are encountered during construction or maintenance activities, a significant impact could occur.

Mitigation Measures: Implement Mitigation Measures CR-1, CR-2, CR-3, and CR-4.

Mitigation Measure CR-1: Environmental Awareness Training

Prior to the initiation of any construction work, an archaeologist who meets the U.S. Secretary of Interior's professional standards shall conduct environmental awareness training for construction crews and other relevant Project personnel. At a minimum, the training will cover the kinds of cultural materials that may be present in the Project Area and the protocols to be followed should any such materials be uncovered during construction. Training shall be required at the onset of each year of construction and maintenance activities to educate new construction personnel.

Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Mitigation Measure CR-2: Protection of the Welapl Site

Prior to initial ground disturbing work in the vicinity of the Welapl site, an archaeologist who meets the U.S. Secretary of Interior's professional standards shall re-survey the area for the presence of surficial cultural resource deposits. The archaeologist shall also excavate 4-5 auger borings in the vicinity of the site to assess subsurface conditions.

If historical or archaeological resources are found in the vicinity of the site, CDFW shall implement measures to protect the integrity of the resource and ensure that no additional resources are impacted, as provided in Mitigation Measure CR-4. If no historical or archaeological resources are identified

during the surface inspection or subsurface exploration, Project activities may commence without monitoring by an archaeologist.

Subsequent invasive plant management activities in the vicinity of the Welapl site would not be subject to the surface and subsurface assessment requirements provided above, unless otherwise required by CDFW and/or SHPO in accordance with Mitigation Measure CR-4.

Mitigation Measures CR-3: Protection of the 1929 USC&GS Complex

Prior to initial ground disturbing work in the vicinity of the 1929 USC&GS Complex, an archaeologist who meets the U.S. Secretary of Interior's professional standards shall re-survey the area for the presence of surficial cultural resource deposits. The archaeologist shall also employ a metal detector and excavate 4-5 auger borings in the vicinity of the site to assess subsurface conditions.

Due to the lack of clear map evidence of where structures may have been located at this site, an archaeological monitor shall be present during initial ground disturbing activities to identify resources that may have escaped detection during the surface and subsurface investigations. If historical or archaeological resources are found in the vicinity of the site, CDFW shall implement measures to protect the integrity of the resource and ensure that no additional resources are impacted, as provided in Mitigation Measure CR-4.

Subsequent invasive plant management activities in the vicinity of the 1929 USC&GS Complex would not be subject to the surface and subsurface assessments or archaeological monitoring described above, unless otherwise required by CDFW and/or SHPO in accordance with Mitigation Measures CR-4.

Mitigation Measure CR-4: Protect Archaeological Resources During Construction

If potential archaeological resources are uncovered during construction, the Project contractor shall halt work within 100 feet (30 meters) of the discovery, and CDFW shall be immediately notified. Should any cultural resources be discovered during construction on lands under the jurisdiction of the SLC, CDFW shall consult with the SLC. Workers shall avoid altering the materials and their context, and shall not collect cultural materials.

A qualified archaeologist shall be retained to investigate the find. If the find potentially qualifies as a historic resource or unique archaeological resource under CEQA, all work must remain stopped in the immediate vicinity to allow the archaeologist to evaluate any materials and recommend appropriate treatment. If the resources are Native American in origin, representatives of the appropriate culturally affiliated tribes shall also be enlisted to help evaluate the find and suggest appropriate treatment. The final disposition of archaeological and historical resources recovered on state lands under the jurisdiction of the SLC must be approved by the SLC.

The preferred treatment of a resource is protection and preservation. Protection and preservation can be achieved by avoidance (not disturbing areas within the boundaries of an archaeological site). In considering any recommended measures proposed by the archaeologist, CDFW shall determine whether avoidance is feasible in light of factors such as the nature of the find, Project design, costs, and other considerations. If avoidance is infeasible, other appropriate measures as recommended by the archaeologist (e.g., data recovery or protection in place) shall be instituted. Work may proceed on other parts of the Project while mitigation for these resources is being carried out.

If data recovery is performed, it must be conducted by qualified archaeologists using standard archaeological techniques. Data recovery must include processing and analysis of recovered cultural materials using appropriate archaeological methods, and preparation of the recovered materials for permanent disposition (e.g., re-burial in a part of the Project Area that would be protected in perpetuity).

Level of Significance: Less than significant after mitigation.

Implementation of Mitigation Measures CR-1, CR-2, CR-3, and CR-4 would reduce potentially significant impacts on the Welapl Site, the 1929 USC&GS Complex, and potential undiscovered cultural resources to a less-than-significant level by providing a process for evaluation of any resources encountered during construction, and avoidance or data recovery of resources consistent with appropriate laws and requirements.

Impact CR-2: 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 in the study area, the possibility of encountering archaeological resources that contain human remains cannot be discounted. Therefore, the impact related to the potential disturbance or damage of previously undiscovered human remains, if present, is considered potentially significant.

Mitigation Measures: Implement Mitigation Measure CR-5.

Mitigation Measure CR-5: Protect Human Remains if Encountered during Construction

If human remains, associated grave goods, or items of cultural patrimony are encountered during construction, work shall halt in the vicinity of the find and the County Coroner and CDFW shall be notified immediately. The following procedures shall be followed as required by PRC Section 5097.9 and HSC Section 7050.5. The final disposition of archaeological, and historical resources recovered on state lands under the jurisdiction of the SLC must be approved by the SLC. If the human remains are determined to be of Native American origin, the Coroner shall notify the Native American Heritage Commission within 24 hours of the determination. The Native American Heritage Commission shall then notify the MLD, who has 48 hours to make recommendations to the landowner for the disposition of the remains. A qualified archaeologist, CDFW, SLC (if appropriate) and the

MLD shall make all reasonable efforts to develop an agreement for the treatment, with appropriate dignity, of any human remains and associated or unassociated funerary objects. The agreement would take into consideration the appropriate excavation, removal, recordation, analysis, custodianship, and final disposition of the human remains and associated or unassociated funerary objects.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure CR-5 would reduce the impact of Project activities on potentially unknown human remains to a less-than-significant level by addressing discovery of unanticipated remains, associated grave goods, or items of cultural patrimony consistent with appropriate laws and requirements.

3.5.6 Cumulative Impacts

Impact CR-C-1: Would the Project contribute to a cumulatively significant impact to cultural resources?

Implementation of the cumulative projects listed in Table 3-1 (Projects Considered for Cumulative Impacts) may require grading and excavation that could potentially affect cultural resources or human remains, or modify or otherwise impact historic buildings/structures. If these resources are not protected, the cumulative effect of the Project plus cumulative projects could be significant. CEQA requirements for protecting cultural resources and human remains would be applicable to each of the cumulative projects. As discussed in this section, record searches and research were undertaken to ensure that cultural resources and/or human remains that could be impacted by the Project were identified. Implementation of Mitigation Measures CR-1 through CR-5 would reduce impacts to a less-than-significant level. With implementation of the mitigation measures, the Projects contribution to this cumulative impact would not be cumulatively considerable, and therefore less than significant.

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant.

3.5.7 References

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3.6 Geology and Soils

This section evaluates the potential impacts to geology and soils during construction, invasive plant management, and maintenance of the proposed Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. For the purpose of this section, the study area includes the Project Area and areas adjacent to the Project Area that may be or become geologically unstable and that could impact resources in the Project Area.

3.6.1 Setting

The study area includes a sliver of coastline that comprises approximately 1,070 acres. It extends for nearly four miles between the Eel River mouth and Table Bluff. North Bay and McNulty Slough represent the south and east boundary of the study area and the Pacific Ocean forms the west boundary. Immediately east and parallel to the beach is a dune field that forms a low ridgeline. Collectively, the beach and dune field represent a barrier beach/spit that separates the Eel River valley and delta from the ocean. Between the barrier beach and McNulty Slough is a lowland saltmarsh that was diked and drained to accommodate livestock grazing during the late 1800s. Associated with that grazing was the construction of a network of levees that border both sides of McNulty Slough and diminish tidal exchange into and across the saltmarsh.

Geologic Setting

Regional Geology

Published geologic maps (Ogle 1953; Evenson, 1959; McLaughlin et al. 2000) show the study area located within the lower Eel River valley, which is underlain with unconsolidated Holocene to Pleistocene fluvial and floodplain deposits consisting of sand, silt, and gravel deposited in near-shore, estuarine, and fluvial environments (Figure 3.6-1 – Regional Geologic Setting). Evenson (1959) documents that groundwater levels (i.e., the groundwater table) within the lower Eel River valley generally lies within 20 feet of the ground surface. The valley is a broad northwest-southeast trending syncline (fold) formed by active compression tectonics (Carver 1987; Clarke 1992; Kelsey 2001). The valley's average rate of subsidence over the last 2,000 years is reported to be 1 – 3 millimeters (mm) per year; however, that subsidence has occurred abruptly during sudden events that are hypothesized to be related to major earthquakes within the southern Cascadia subduction zone (Li and Carver 1992; Kelsey 2001). The valley is bounded along the south by the Ferndale fault (McLaughlin et al. 2000) and the steeply inclined sedimentary rocks that form the Ferndale Hills (Ogle 1953). To the north, the valley is bounded by a broad arching fold named the Table Bluff anticline, which creates the uplands area of the

same name. That anticline is considered genetically related to the Little Salmon thrust fault system (Ogle 1953; McLaughlin et al. 2000; Kelsey 2001) but not the specific trace of that fault, which is formally designated by the State of California as a Holocene active fault (Davis 1991; CGS 2018).

Seismic Setting

The lower Eel River valley is controlled by numerous folds and faults generated in response to active compression tectonics. More specifically, the valley lies about 30 miles north of the Mendocino Triple Junction (MTJ) where three vast tectonic plates meet. South of the MTJ, the Pacific plate is juxtaposed against the North American Plate (NAP) along the strike-slip San Andreas fault zone. North of the MTJ, including the area just offshore from the study area, the Gorda plate converges with and subducts beneath the NAP at the southern end of the Cascadia subduction zone (CSZ). The MTJ has been migrating northward for approximately 30 million years and that migration has generated the tectonic compression that created the folds and faults which control the physiography of the Eel River valley. Additionally, the complex interactions between the three plates at the MTJ make this region one of the more tectonically active areas of the world (Furlong and Schwartz 2004). That tectonic activity generates multitudes of earthquakes and associated ground-shaking that is felt throughout the region. Because the lower Eel River is underlain by generally saturated alluvial sediments (Ogle 1953; Evenson 1959), earthquake shaking in the area is likely to be stronger because seismic waves move more slowly through these softer sedimentary earth materials.

Dengler et al. (1992) identify five sources of seismicity on the North Coast of California which include: the Gorda plate, the Mendocino fault that marks the boundary between the Gorda and Pacific plates, the San Andreas fault, the NAP, and the CSZ. Dengler et al. (1992; see Figure 5) also document that communities located along the stretch of coastline between Petrolia and Eureka, which includes the study area, had been subjected to at least 15 earthquakes with strong ground shaking since the year 1900. Some of those communities had experienced 23 such events. Of those events, one occurred along the CSZ on April 25, 1992 and was a 7.1 moment magnitude (M) earthquake that generated severe shaking in the towns of Petrolia, Ferndale, Rio Dell, and Scotia. That earthquake was felt in southern Oregon, as far south as San Francisco, and in Reno, Nevada (USGS 2020). In the lower Eel River valley, very strong ground-shaking occurred in response to a 5.3 M earthquake that occurred near Ferndale on June 7, 1975. Additional information on the seismicity of northern California is available from the California Geological Survey (CGS). For example, Special Publication 115 (Toppozada et al. 1995) is a planning scenario for a "great" 8.4 M moment magnitude earthquake along the CSZ in Humboldt and Del Norte counties. Map Sheet 48 (Branum et al. 2016) shows the relative intensity of ground shaking from anticipated future earthquakes throughout the state. Furthermore, a joint effort by the U.S. Geological Survey (USGS) and CGS (Petersen et al. 1996) presents a probabilistic seismic hazard assessment for the state.

Soils

Soil units mapped within the study area by the National Resource Conservation Service (NRCS, 2020) include many soil "series" that in most locations are so

intricately distributed amongst each other that they are described together as “complexes”. Soil series present along the Tablebluff uplands at the north end of the study area include the Hookton, Tablebluff, Cannonball, Candymountain, and Leopoli. Hookton soil is a very deep loam that is somewhat poorly drained and derived from mixed alluvium. Tablebluff soil is a very deep silt loam that is moderately well drained and derived from eolian deposits over mixed alluvium. Cannonball soil is a very deep sandy loam that is well drained and derived from mixed marine sediments. Candymountain soil is a very deep silt loam that is moderately well drained and derived from mixed marine sediments. Leopoli soil is a very deep loam that is well drained and derived from eolian deposits over mixed alluvium.

Soil series associated with the barrier beach and dune field along the west side of the study area include the Oxyaquic Udipsamments, Samoa, and Clambeach. Oxyaquic Udipsamments soil is associated with beaches, is very deep fine sand that is moderately well drained and derived from beach sand and gravel. Samoa soil is associated with dunes, is very deep sand that is somewhat excessively drained and derived from eolian and marine sand deposits. Clambeach soil is very deep sand that is very poorly drained and also derived from eolian and marine sand deposits.

Soils series present within the lowland saltmarsh portions of the study area include the Weott, Occidental, and Wigi. Weott soil is very deep silt loam that is very poorly drained. It is associated with backswamps and floodplains and is derived from mixed alluvium. Occidental and Wigi soils are very poorly drained, deep silty clay loam. They are both associated with saltmarsh habitat and are derived from mixed alluvium. Wigi soil is also very deep silty clay loam that is very poorly drained. It is associated with saltmarsh habitat and is derived from mixed alluvium. Levees bordering McNulty Slough were constructed from borrow ditches excavated in these same soils. LACO (2014) describes the earth materials comprising the levees as dark-gray to very-dark-gray, soft to medium-stiffness, silt and silt with fine sand. As per specific soil testing and the Unified Soil Classification System nomenclature, LACO (2014) classifies the earth material within the levees as being mostly silt with some clay. Additional discussion of soil types within the Project Area is provided in Section 3.2 (Agriculture and Forestry Resources). Soils mapped in the Project Area are illustrated on Figure 3.2-1, NRCS Mapped Soil Units.

Expansive Soils

Expansive soils are capable of causing considerable distress to roads and building foundations as they “*rise-and-fall*” in accordance with the cycles of soil wetting (swelling) and drying (shrinking). Soils with high percentages of silicate clays are those that have the potential for shrinking and swelling. The clay content of a soil can be estimated in terms of its “*plasticity*” which means it can be molded and rolled into a thin thread provided the water content is appropriate (Brady and Weil 1996). Mapping by the NRCS (2020) shows the lower elevation areas of the study area to have the highest percentage of clay content ranging between 30 percent and 40 percent with Plasticity Index values of between 8 and 16. Thus, those soils in the lower elevation areas of the study are defined as silty clay loam and are considered to have a low to medium potential for expansion.

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. Slope angle is another factor in soil erosion – the greater the angle and longer the slope, the greater the erosion hazard, especially if the soil is bare of vegetation. With the exception of the existing channels, levees, dune side slopes, and Table Bluff, slope gradients in the study area are generally flat (less than five percent). See Section 3.9 (Hydrology and Water Quality) for a discussion of geomorphic processes, including accretion and erosion of slough channels due to tidal processes.

Specific to the levees along McNulty Slough, a qualitative analysis of levee erosion potential was undertaken in the study area by LACO (2014). Criteria including bank slope, soil type, width of marsh flat, presence of revetment, vegetation cover and location within the slough with respect to tidal exchange were combined and assigned values of relative erosion potential. Segments of the eastern and western McNulty Slough levees were then ranked according to the erosion potential valuation results which ranged from moderate to very high. The western McNulty Slough levee ranked as mostly high (66 percent), followed by moderate (20 percent), with a small portion of the levee ranked as having very high erosion potential (2 percent). Approximately 12 percent of the western levee was not assigned a value of relative erosion potential because an old failed levee was blocking the current levee which was not visible by boat, located in central Area B and identified as segment 7W (LACO 2014). The eastern McNulty Slough levee also ranked mostly high (80 percent) with some segments in the very high (20 percent) category. The erosive processes at work are those normally associated with tidal exchange flows during ebb and flow tides. For an analysis of the Project's potential impacts on water quality from removal of dense-flowered cordgrass, the McNulty Slough levees, and scouring potential refer to Section 3.9 (Hydrology and Water Quality).

Seismic Hazards

As described above, the study area lies within a seismically active region subject to frequent moderate to large earthquakes. Seismic hazards are those that could reasonably be expected to occur in the study area during a major earthquake on any of the nearby faults. Some hazards can be more severe than others depending on the location, underlying materials, and level of ground shaking. The State of California formally recognizes surface ground rupture, liquefaction, earthquake-induced landslides, tsunamis, and amplified ground shaking as the primary seismic hazards of concern. Zoning of fault rupture hazard is codified in the Alquist-Priolo Earthquake Fault Zoning Act of 1972 (Public Resources Code [PRC], Division 2, Chapter 7.5, Section 2621-2630), while zoning of the other hazards is formalized in the Seismic Hazards Mapping Act of 1990 (PRC, Chapter 7.8, Section 2690-2699.6). The California Department of Conservation is responsible for implementing these acts and the work is conducted by CGS. Numerous publications have been prepared over the years as this work has progressed. Chief among those publications are numerous 1:24,000 scale maps delineating active fault traces as well as various guidelines, such as Special Publication 42 titled: Earthquake Fault Zones; A Guide for Government Agencies, Property Owners / Developers, and

Geoscience Practitioners for Assessing Fault Rupture Hazards in California (CGS 2018). Other reports include Special Publication 117A titled: Guidelines for Evaluating and Mitigating Seismic Hazards in California (CGS 2008), and Special Publication 118 titled: Recommended Criteria for Delineating Seismic Hazard Zones in California (CGS 2004).

Surface Fault Rupture

“Surface fault rupture is the result of fault movement that breaks to the surface of the earth either suddenly during earthquakes, or slowly due to a process known as fault creep, and is the result of tectonic movement that originates deep in the Earth” (CGS 2018). 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. The study area does not lie within an Alquist-Priolo “Fault Rupture Hazard Zone.” However, it does lie less than five miles southwest from the Little Salmon fault that is zoned as Holocene-active. Additionally, the study area lies approximately 32 miles from both the MTJ located to the south and the CSZ offshore to the west.

Ground Shaking

Earthquakes have the capacity to produce a range of ground shaking intensities in the study area, but the area has not yet been mapped in terms of delineating a “Seismic Hazard Zone” by the State of California. Key factors in a particular site’s susceptibility to ground shaking include the magnitude of the earthquake, the distance between the site and the earthquake focus, and the local geological conditions at the site. Ground shaking is amplified in softer rocks and sedimentary basins like that of the lower Eel River valley. Ground motion during an earthquake includes parameters such as horizontal and vertical acceleration, seismic wave velocity, and duration of shaking. A common measure of ground motion is the peak ground acceleration (PGA). PGA is measured using strong motion accelographs that are similar to seismographs that record earthquake waves; typically, horizontal (i.e., side-to-side) acceleration is greater during an earthquake than the vertical (up-and-down) acceleration. PGA is typically expressed as a percentage of gravitational acceleration (g). A scale (see Table 3.6-1) combining PGA ranges, instrumental intensity, and qualitative descriptions of earthquakes similar to that used in the Modified Mercalli Intensity scale has been prepared for California by USGS as a recent refinement of the ShakeMap system (Wald et al. 2005).

PGA is a parameter used in the design of buildings in areas of high seismicity. A common standard is that buildings be designed to withstand the ground shaking at a site that has only a 10% chance of being exceeded in 50-years. This also means there is a 90% chance that such ground motions will not be exceeded in 50 years at the site. Using the CGS online Ground Motion Interpolator (CGS 2020) and a Vs30 value of 180 meters per second (m/s) for the Project Area, a PGA value of 0.49g is returned. In other words, the model indicates that over the next 50 years, the study area has only a 10% chance of experiencing a PGA of 0.49g (49% g). Such shaking would be associated with a severe earthquake. For perspective, the strong to very strong ground shaking experienced in the lower Eel River valley associated with

earthquakes that occurred in 1975 and 1992 (see above) has been estimated by the USGS (ShakeMaps) to have been in the range of 0.1g to 0.2g respectively.

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 strong ground shaking. Typical consequences of liquefaction 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 (Bolt 1993; Yeats 1998; Pipkin et al. 2005). Liquefaction is particularly common in clean loose sand or gravelly sand deposits that are saturated with water and buried less than 30 feet below the earth’s surface (Yeats 1998).

As introduced above, Evenson (1959) documents a very shallow groundwater table in the lower Eel River valley as well as deposits of unconsolidated deposits of sand and gravel underlying the valley floor. Thus, the potential exists for liquefaction to occur within the study area. Kilbourne et al. (1980) document a potential for liquefaction in the lower Eel River valley and include notes from Lawson et al. (1908) regarding widespread instances of liquefaction in the lower Eel River valley generated in response to the 1906 San Francisco earthquake. Additionally, the Division of Mines and Geology (DMG 1992) reports widespread liquefaction in the Eel River valley associated with the April 1992 Petrolia earthquake. Moreover, map S-1 and S-3 of Special Publication 115 (Topozada et al. 1995) shows the lower Eel River valley and the study area to have a high potential for liquefaction associated with a “great” earthquake along the CSZ. Collectively the discussion above supports the conclusion that the potential for liquefaction to occur within the study area in response to strong ground shaking is high.

Slope Failure and Landslides

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope movement of earth material, either triggered by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Various factors involved with landsliding include: slope inclination, lithology, bedding orientation, surface drainage patterns, groundwater levels, and past patterns and instances of mass wasting. Additionally, landslides are characterized and classified on the basis of specific criteria such as depth of debris and earth material composition (CGS 2013). NRCS (2020) employs the term “soil slippage potential” to describe a hazard in which a mass of soil will slip when vegetation is removed, soil water is at or near saturation, or when other normal practices are applied.

Table 3.6-1. Qualitative ShakeMap Instrumental Intensity Scale

Inputs	Intensity								
Perceived shaking	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
Potential damage	None	None	None	Very light	Light	Moderate	Moderate to heavy	Heavy	Very heavy
Peak Acceleration (%g)	< 0.17	0.17 – 1.4	1.4 – 3.9	3.9 – 9.2	9.2 – 18	18 – 34	34 – 65	65 – 124	> 124
Peak Velocity (cm/s)	< 0.1	0.1 – 1.1	1.1 – 3.4	3.4 – 8.1	8.1 – 16	16 – 31	31 – 60	60 – 116	> 116
Instrumental Intensity	I	II–III	IV	V	VI	VII	VIII	IX	X+

Source: Wald et al. 2005

The study area is characterized by low-relief tidally inundated saltmarsh, dunes that form a low ridgeline along the west boundary, aging levees located along both banks of McNulty Slough and within the interior of Project Area, and the Table Bluff uplands, with a small amount of freshwater and brackish wetlands near its base. The nearest slopes having a gradient of 25 percent or greater occur along the flanks of Table Bluff. NRCS (2020) describes the soil slippage potential of Table Bluff to be low. Similarly, published geologic maps (Ogle 1953; Evenson 1959; McLaughlin et al. 2000) do not show landslides in the study area. Therefore, the potential for slope failure and landslide hazards are considered to be low within the study area.

Tsunami

A tsunami is a wave, or series of waves, generated by an earthquake, landslide, volcanic eruption, or even large meteor hitting the ocean (CGS 2012). As outlined in Topozada et. al. (1995, Map S-1), the study area is vulnerable to tsunami runup (i.e., inundation) associated with a great earthquake along the CSZ.

Dune Development

The west boundary of the study area is a barrier beach/spit composed of a shoreline beach and a dune field immediately east of the backshore. Barrier beaches are formed through a complex interaction between sea level changes, longshore transport of sand, wave action, and wind (McCubbin 1982; Easterbrook 1993; USACE 2002). Longshore transport is the term used to describe the movement of water and sediment parallel to the coastline. These are the currents that move sediment discharged from river mouths up or down the coastline. Wave action continually extracts sediment from the longshore currents and distributes it along the adjacent beach. Storm waves deposit even more sand on the beach and transport it to the backshore area. Once on the beach, the sand is then picked up and blown by winds inland and beyond the beach forming a sand dune field. Primary dunes are composed of sand blown directly from the beach face. Secondary dunes form in response to the subsequent modification of the primary dune by continued wind (eolian) processes and are generally located further inland (Sloss et al. 2012).

Foredunes are primary dunes that rise-up from the backshore of the beach and includes two types: incipient foredune and established foredune. Incipient dunes are low relief primary dunes that accumulate in the backshore portion of the beach above the high tide mark. These dunes are generally small, parallel to the beach, and are the result of wind-blown sand being trapped by a roughness element such as large wood or vegetation (Sloss et al. 2012). Established foredunes develop from the incipient dune and have greater height, width, age, and morphological complexity. Additionally, they commonly coalesce to form a prominent ridgeline parallel to the beach. As the dunes get larger and older, vegetation cover increases, and they become more stable. However, they remain susceptible to modification via wind erosion and a field of secondary dunes generated by that modification forms immediately inland of the foredune. Secondary dunes develop in response to wind erosion of the primary dunes and are of a variety of different forms: parabolic, barchan, transverse, longitudinal, and blowouts (USACE 2002; Sloss et al. 2012). Periodically, storm waves locally breach the foredune ridge as “overwash” that erodes a shallow channel through the foredune and into the secondary dune field. Sand and flotsam entrained with the overwash settles out as a “washover” fan within

the secondary dune field (McCubbin 1982; Easterbrook 1993). Relict foredunes are old foredunes that now lie inland from the contemporary foredune and are incorporated (partially buried) within the field of secondary dunes. Their presence is indicative of a shoreline that is advancing seaward (i.e., progradation). Collectively, Smith (1954) describes the morphology of a coastal dune field as a “complex maze of ridges, mounds, and hollows with seemingly extreme degrees of disorder”.

In the study area, the Eel River is a major supplier of sand to the longshore current within the Eureka Littoral cell. Littoral cells are segments of the coast with distinct sediment sources, defined longshore transport pathways, and sinks where the sediment is removed from the littoral system (Patsch and Griggs 2006). The Eureka littoral cell stretches between Trinidad Head located approximately 30 miles north of the study area to the rocky outcroppings of False Cape located approximately 10 miles south of the study area (Patsch and Griggs 2007). Although the prevailing wind direction is from the north and northwest, a predominant longshore current direction is not considered to exist within the Eureka littoral cell, and the available evidence suggests that currents of the Eureka littoral cell moves in both directions especially along the south end of the cell (Patsch and Griggs 2007). However, longshore transport within the Eureka littoral cell is resulting in seasonal accretion (or progradation) of the shoreline within the study area located north of the Eel River mouth, and seasonal erosion of the shoreline located south of the mouth of the Eel River (KHE 2015; Hapke et al.2006; Patsch and Griggs 2007). Moreover, the volume of large wood distributed along the beach north of the Eel River mouth is vastly greater than that distributed to the south. Thus, while a predominant longshore current is not considered to exist in the south portion of the Eureka littoral cell (Patsch and Griggs 2007), it appears obvious that longshore transport is generally to the north during the winter when large volumes of water, sediment, and wood are discharged from the Eel River. See Photo 3.6-1 for a visual representation of north trending littoral transport at the mouth of the Eel River and Figure 3.6-2 (Shoreline Accretion and Erosion Trends Eel River Segments).



Photo 3.6-1 Longshore sediment transport at the Eel River mouth within the Eureka littoral cell. North is to the left, and the sediment plume is being carried north by the longshore current. Photograph by B. Finney, January 18, 2016.

As part of a larger investigation of the Eel River estuary and associated dune fields south of the Eel River mouth, Kamman Hydrology & Engineering, Inc., (KHE) also analyzed a segment of the beach and dunes within the study area. Based on a detailed analysis of geomorphic changes documented in aerial photographs and a comparison of topographic profiles, KHE (2015) found that up until about 1993, a fairly stable dune field existed in the study area with a single set of foredunes up to 20 feet in elevation. Between 1993 and 2005 however, a period of dune construction occurred in which a second and completely independent foredune ridge formed approximately 260 feet west of the original foredune (Photo 3.6-2). The seaward advance of the dune field is referred to as dune progradation, and the previous foredune system becomes relict (Sloss et al. 2012). An independent review of aerial photographs taken in 1948 confirms KHE's conclusion regarding the presence of a fairly stable dune field prior to 1993. More specifically, the foredune ridge line visible in the 1948 photographs is generally coincident with that of 1993. Additionally, a striking difference visible in the 1948 photographs is a general lack of vegetation cover across the entire dune field.



Photo 3.6-2: “Relict” (pre 1993) foredune ridge on the right (east) and contemporary foredune ridge to the left (west). View looking north through the trough between the two ridgelines. Note the dense proliferation of European beachgrass. Photograph by M. Smelser, April 10, 2020.

The contemporary dune field is largely covered by the invasive non-native European beachgrass. European beachgrass develops vigorous roots and rhizome systems, and active sand burial stimulates the production of new shoots that extend several feet below the surface (Pickart and Sawyer 1998). The plant grows fast and spreads both as a steady advance into the foredunes and as dispersed in-fillings within the secondary dune field (Photo 3.6-3). Pickart and Sawyer (1998) also report that it is the vertical rhizome system which is responsible for the plant's superior dune-building (i.e., anchoring) capabilities.

Planting of European beachgrass on west coast dunes was common in the first half of the twentieth century. First introduced at Golden Gate Park, San Francisco in the late 1800s (Lamson-Scribner 1895] in Pickart 1998), the species was heralded as a desirable sand stabilizer and was eventually embraced by U.S. Soil Conservation Service and other agencies (Pickart 1997). Since then it has spread and invaded large areas of Humboldt County's coastal dunes, including most of the dune field

within the study area. Preliminary vegetation mapping by CDFW indicates that the study area includes approximately 345 acres of sand dunes. At least 40 percent, and perhaps as much as 60 percent of that dune area is covered by European beachgrass. Oblique aerial photographs taken in 1979 and 2013 of the study area (Photos 3.6-4a and b) show the dramatic increase of European beachgrass over time, the new foredune ridgeline, and the overall stabilization of the entire dune field.



Photo 3.6-3: European beachgrass on left advancing on patchy dune-mat vegetation, and into a sculpted hollow of the secondary dune field. Because dense of European beachgrass largely prevent mobilization of the underlying sand, dunes so vegetated are considered “stabilized.” In contrast, those dunes with patchy vegetation and many bare spots capable of being eroded are considered “semi-stable.” View is looking north toward the Table Bluff uplands. Photograph by M. Smelser, April 10, 2020.



1979



2013

Photos 3.6-4a and b Oblique aerial photographs of the Project Area which showing the seaward advance of both the dune field and the dense infestation of European beachgrass between 1979 and 2013. Note the hairpin turn of McNulty Slough in the background and the Sand Road visible in the middle of each photograph stretching from left to right. Photographs sourced from the CA Coastal Records Project, taken by Kenneth and Gabrielle Adelman.

The sand-trapping ability of European beachgrass has resulted in geomorphologic as well as ecological impacts to dunes along the west coast which is discussed in Section 3.4 (Biological Resources). Within the study area, the steep, continuous foredune ridge built and structurally reinforced by European beachgrass has had repercussions for both plants and animals. Specifically, foredunes are no longer reworked to the extent they once were, and the flow of sand into the secondary dune field behind the foredune has been largely cut-off thereby reducing active dune processes and the associated disturbance of the substrate. Additionally, the thick proliferation of European beachgrass across the secondary dune field has generally arrested normal dune processes and dynamism throughout that area as well. Such dynamism or disturbance is considered an essential ecosystem driver in dune systems that keeps the environment patchy and promotes high species diversity (Pickart 2008). For this discussion, dunes completely covered in European beachgrass that prevents mobilization and reworking of the underlying sand substrate are considered “*stabilized*.” In contrast, dunes covered in patchy native vegetation and with much exposed substrate are defined as “*semi-stable*.” Historic aerial photographs from 1948 and 1965 (i.e., prior to European beachgrass invasion) indicate that in general, the semi-stable secondary dune field extended about 600 feet east of the foredune. Locally however, the east limit of the dune field stretches approximately 800 feet beyond the foredune.

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 (California Public Resources Code, Division 2, Chapter 7.5) was passed in 1972 to mitigate the hazard of surface faulting (i.e., ground rupture) to structures designed for human occupancy (CGS, 2018). 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. In accordance with the Alquist-Priolo Act, the State Geologist is responsible for delineating regulatory zones, called “earthquake fault zones,” around the surface traces of faults that exhibit evidence of ground rupture during the Holocene Epoch (i.e., the last ~11,700 years). These zones are depicted on USGS 7.5-minute topographic quadrangle maps and published by the CGS. Because many active faults are complex and consist of more than one branch, earthquake fault zones can extend several hundred feet on either side of the mapped fault trace. Within these zones, buildings for human occupancy cannot be constructed unless the building site has been formally investigated by a Professional Geologist who has prepared a geologic report demonstrating that the proposed structure would not lie astride the trace of an active fault.

While the study area lies approximately 3.5 miles southwest of the Little Salmon fault zone which is an Alquist-Priolo Earthquake Fault Zone (CGS 2019), no portion of

the study area lies within such a fault zone. The Project also would not include construction or ongoing use of buildings that meet the criterion for human occupancy. Therefore, the regulatory provisions of the Alquist-Priolo 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. More specifically, the act sets forth a statewide minimum public safety standard such that buildings for human occupancy do not collapse in response to an earthquake (CGS, 2008). While the Alquist-Priolo Act addresses surface fault rupture, the Seismic Hazards Mapping Act addresses other earthquake-related hazards, including strong ground shaking, liquefaction, and seismically induced landslides. Its provisions are similar in concept to those of the Alquist-Priolo Act in that the State Geologist is charged with identifying and delineating areas at risk of strong ground shaking, liquefaction, landslides, and other corollary hazards. Counties and cities are then tasked regulating development within the mapped Seismic Hazard Zones. In particular, 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 by a state-licensed engineering geologist or civil engineer, and measures to reduce potential damage have been incorporated into the development plans.

Official Seismic Hazard Zone Maps have not yet been prepared for all parts of the State, and the lower Eel River valley (i.e., the study area) is one region that has not been mapped for seismic hazards such as liquefaction and landsliding. Humboldt County's Web GIS contains generalized geologic hazard (e.g., liquefaction and landslides) zoning delineations and uses that information as part of the decision-making process in the issuance of County building permits.

California Building Code

The State of California provides minimum standards for building design through the California Building Code (CBC 2019). The CBC applies to building design and construction in the state and is based on the 2018 International Building Code (IBC) that is in use or has been adopted in the 50 U.S. states. In other words, the CBC represents a modification of the IBC unique to the needs and conditions of California. Seismic safety and structural design requirements are set forth in CBC Chapter 16. Chapter 18 provides criteria for geotechnical and structural considerations related to the investigation of soils as well as the design and construction of foundations and retaining walls. Appendix J regulates earthwork grading activities including drainage and erosion control, and construction on unstable soils such as those subject to liquefaction.

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 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 prehistoric ruins, vertebrate paleontological site (including fossilized footprints), or any other paleontological, or historical feature situated on public lands, except with the express permission of the public agency that has jurisdiction over the lands. 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.

California Coastal Act

The Project Area is within the Coastal Zone. The California Coastal Act contains policies relevant to paleontological resources. The following Coastal Act sections are relevant to this analysis:

Public Resources Code Section 30244 Archaeological or paleontological resources

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

Regional and Local

Lands within the Project Area are owned by the California Department of Fish and Wildlife (CDFW) or are under the jurisdiction of the State Lands Commission, and therefore will not require local permits (i.e., Conditional Use Permit) from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Per hydraulic modelling and the Basis of Design Report, construction, invasive plant management and maintenance activities are not anticipated to affect geology and soils outside of the Project Area, except for potential impacts to the eastern McNulty Slough levee which is discussed in Section 3.9 (Hydrology and Water Quality). Therefore, local and regional regulatory policies are not included in the analysis of this section.

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:

- Directly or indirectly cause 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. Refer to Division of Mines and Geology Special Publication 42;
 - 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.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.
- Directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Area of No Project Impact

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

- **Would the Project directly or indirectly cause 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?** There are no structures within the Project Area, and no habitable structures are proposed under the Project. Additionally, 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. Therefore, this significance criterion is not applicable to the Project and is not discussed further.
- **Would the Project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides?** The Project Area is characterized by flat terrain, dunes, levees and Table Bluff to the north. According to the NRCS Web Soil Survey, the soil slippage potential of Table Bluff is low (NRCS 2020). Similarly, landslides are not common in the study area. Therefore, landslide hazards are considered to be low. As a result of the flat terrain, and lack of landslides in the vicinity, 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.
- **Would the Project 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 or construction 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 study area is defined as the Project Area and areas adjacent to the Project Area that may be, or may become, geologically unstable and which could impact

resources in the Project Area. Project activities are evaluated in terms of their potential significance to impact (i.e., increase risks associated with) the identified geologic hazards. Mitigation measures are then described for those impacts determined to be significant.

3.6.5 Impacts and Mitigation Measures

Impact GEO-1: Would the Project directly or indirectly cause potential substantial adverse effects including the risk of loss, injury, or death involving strong seismic ground shaking or seismic-related ground failure, including liquefaction?

As described in Section 3.6.1, the study area is located within a seismically active region which is subject to frequent moderate to large earthquakes. Additionally, liquefaction has been documented in the lower Eel River valley as a function of larger earthquakes, and potential for liquefaction during a large future earthquake is considered high.

The Project includes the installation of a bridge spanning approximately 50 feet over the BI-3 breach, as well as a box culvert crossing at BI-4, which would be at risk of collapse from ground shaking and liquefaction. Recreational amenities including the parking lot, kiosk and non-motorized boat put-in as well as the access road and existing levees would similarly be susceptible to damage during strong seismic ground shaking.

Increased tidal exchange within McNulty Slough and the interior saltmarsh is not expected to materially change liquefaction potential of the underlying soils because increased tidal exchange would not substantially alter either the distribution of subsurface sediments or the degree to which those sediments are saturated. On the other hand, liquefaction within the Project Area has the potential to generate localized ground failures that could adversely impact portions of the existing levees as well as the bridge, culvert and non-motorized boat put-in. The parking lot and kiosk would be constructed on higher ground and are therefore less likely to be affected by liquefaction as compared to the low-lying portions of the study area. To minimize the risk that structures would collapse during seismic ground shaking, all Project structures would be designed by a licensed engineer and would conform to the CBC (2019) and current seismic design standards. Upon incorporating such design standards into the Project, Impact GEO-1 is less-than-significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact GEO-2: Would the Project result in substantial soil erosion or loss of topsoil?

Grading, earthwork, construction access, and long-term maintenance activities that temporarily disturb soils and sand in the Project Area could result in increased potential for erosion or loss of topsoil and sand on- and off-site, which could be a potentially significant impact. To minimize this impact, construction equipment would access individual work sites from the top of existing levees and berms, where possible, and along the sand road, where necessary. Additionally, implementation

of Mitigation Measure WQ-6 (Designate Ingress/Egress Routes) would reduce the potential for soil disturbance and subsequent erosion by minimizing the area used for ingress/egress, staging, stockpiling and storage, which will reduce soil disturbance, and subsequent potential erosion. The temporary access routes along the levees and berms, bridge spanning BI-3, non-motorized boat put-in, box culvert and dunes would be constructed with adequate best management practices (BMP) to ensure immediate protection from erosion and would include design components as needed to ensure long-term stability. Therefore, with implementation of Mitigation Measure WQ-6, the impact would be less than significant.

Low ground-pressure equipment, and/or equipment staged from barges, would be used in discrete restoration areas that are not accessible from existing levees or berms. All areas disturbed by temporary staging and access would be de-compacted and naturalized, as needed, prior to Project completion. In addition, all soil areas where excavation or ground disturbance (including construction and invasive plant management activities) would occur or could deliver sediment to an adjacent surface water would be treated with erosion control BMPs (see Mitigation Measure HWQ-1 [Implement Best Management Practices to Protect Water Quality], and HWQ-2 [Erosion and Water Quality Control Measures During Channel Excavation and Ground Disturbance] below).

The physical disruption associated with European beachgrass removal in dune ecosystems can reset vegetation succession and increase the abundance of early successional species, including the endangered beach layia (*Layia carnosa*) (Pickart and Sawyer 1998). In the Primary and Secondary Treatment Areas, native dune vegetation would both be planted in some areas, and is anticipated to revegetate passively in others. Potential dune destabilization from removal of European beach-grass is anticipated to be temporary while native dune mat communities re-establish, and would also be minimized by the spatial and temporal phasing of vegetation treatments under the Project. Additional discussion of the potential impacts on dune stability resulting from removal of European beachgrass is provided under Impact GEO-3.

Changes in the hydrology of the site, including an increase in the tidal exchange resulting from implementation of the Project, could impact erosion rates within existing tidal channels, newly constructed channels, and/or adjacent waterbodies, such as McNulty Slough. See Section 3.9 (Hydrology and Water Quality) for further analysis of potential erosion resulting from hydrodynamic changes associated with implementation of the Project.

Mitigation Measures: Implement Mitigation Measures WQ-6, HWQ-1, and HWQ-2.

The Project would implement Mitigation Measure WQ-6, as defined from the Programmatic Final EIR for the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey and GHD 2013), hereafter referred to as the 2013 Spartina PEIR, to reduce potential impacts from erosion and loss of topsoil. The 2013 Spartina PEIR measures have been slightly adapted to reflect that their implementation would also apply to invasive plant management of European beachgrass, and to other Project activities that would result in comparable potential impacts to soils (e.g., use of equipment to implement the tidal restoration component of the project).

Mitigation Measure WQ-6: Designate Ingress/Egress Routes

Temporary ground disturbance associated with site ingress/egress, staging, stockpiling, and equipment storage areas could occur in areas outside and adjoining work areas. Where areas adjacent to staging and stockpile areas are erosion prone, the extent of staging and stockpile shall be minimized by flagging their boundaries. An erosion/sediment control plan shall be developed for erosion prone areas outside the work area where greater than 0.25 acre (0.1 hectare) of ground disturbance may occur as a result of ingress/egress, access roads, staging and stockpile areas. The erosion/sediment control plan shall be developed by a qualified professional and identify BMPs for controlling soil erosion and discharge for Project-related contaminants. The erosion/sediment control plan shall be prepared prior to any ground disturbing activities, and implemented during construction (H.T. Harvey & Associates and GHD 2013, page 128).

Mitigation Measure HWQ-1: Implement Best Management Practices to Protect Water Quality

The following representative BMPs will be implemented to protect water quality during construction:

- Contractors will be responsible for minimizing erosion and preventing the transport of sediment to sensitive habitats/wetlands. Accordingly, 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.
- The following BMPs from the current California Stormwater Quality Association's California Stormwater BMP Handbook for Construction will be implemented by the Contractor:
 - EC-1: Scheduling
 - EC-2: Preservation of Existing Vegetation
 - NS-2: Dewatering Operations
 - NS-9: Vehicle Equipment and Fueling
 - NS-10: Vehicle and Equipment Maintenance
 - WM-2: Material Use; and
 - WM-4: Spill Prevention and Control
- Sufficient erosion control supplies will be maintained on site at all times, available for prompt use in areas susceptible to erosion during rain events;
- Disturbance of existing vegetation will be minimized to only that necessary to complete the work;

- The contractor will make adequate preparations, including training and providing equipment, to contain oil and/or other hazardous materials spills;
- Dewatering operations will be conducted where needed, with water disposed of appropriately (e.g., allowed to settle in an isolated area, or discharged to an upland location where it won't discharge back to surface waters);
- Vehicle and equipment maintenance should be performed off-site whenever practical;
- The contractor shall ensure that the site is prepared with BMPs prior to the onset of any storm predicted to receive 0.5 inch (1.27 centimeter) or more of rain over 24 hours; and
- All erosion and sediment control measures shall be maintained until disturbed areas are stabilized.

Mitigation Measure HWQ-2: Erosion and Water Quality Control Measures During Channel Excavation and Ground Disturbance

Erosion and turbidity control measures shall be implemented in areas where excavation or ground disturbance would occur and could deliver sediment to an adjacent surface water (e.g., construction of Project tidal channels, installation of ditch blocks and large wood, levee lowering and removal, and installation of public access components). Depending on site conditions, these measures could include installation and maintenance of in-stream turbidity curtains, cofferdams and/or silt-fence along channel banks, as specified in Project designs, specifications and erosion control plans. Whenever feasible, construction will be scheduled to coincide with low tides to avoid increases in turbidity or potential impacts to aquatic habitats. Where possible, channel excavation or dredging will be isolated and hydrologically disconnected from surface waters.

Level of Significance: Less than significant with mitigation.

Impact GEO-3: **Would the Project 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?**

As described above, the Project is located in a unique and dynamic geologic environment in which tectonic plate motion generates strong earthquake shaking along with potential broad crustal uplift and/or subsidence. Liquefaction has occurred in the lower Eel River valley in the past in response to strong earthquake shaking and is expected to occur again during larger earthquakes. This affect is most likely to occur within the saturated low-elevation saltmarsh area, along the beach, and possibly the secondary dunes field within the Project Area. Liquefaction is not expected to occur within the Table Bluff uplands adjacent to the Project Area,

primarily because the sediments underlying that area are better consolidated and not saturated.

Lateral spreading is related to the liquefaction phenomena but requires the earth materials involved to be topographically inclined to facilitate gravitational sliding and displacement. Given the generally flat topography of the beach and saltmarsh, lateral spreading is considered unlikely to occur in those areas. However, it is highly likely that the levees constructed atop the liquefiable salt-marsh sediments would undergo localized deformation and displacements (breaks). Such breaks in the levee would not create adverse environmental impacts such as undesired or unanticipated flooding because the levee system is already breached in several locations and, by design, the Project includes additional levee breaches. The dune field could similarly be subject to lateral spread, but not the Table Bluff uplands because the sediments are better consolidated and not saturated.

Landsliding is considered unlikely in the dune field because the sediment is not consolidated. Landsliding is also unlikely in the low-lying salt-marsh area because there is little topographic relief. However, shallow slumps and debris slides out of the steep levee slopes have occurred in the past and should be expected to occur in the future. In terms of topographic relief, the Table Bluff uplands has the greatest potential for landsliding within the study area. However, obvious indicators (e.g., hummocky topography) of past landslide activity along the slope are not present, so the potential for future landsliding is considered low.

To restore dune morphological processes and ecological function, the Project proposes to eradicate invasive plant species, primarily European beachgrass, to allow native dune mat vegetation communities to re-colonize in the Project Area. As described in Section 2.5.5 (European Beachgrass Management), approximately 279 acres of European beachgrass would be removed from the Primary and Secondary Treatment Areas. The Primary Treatment Area is comprised of the northern 2.6 miles of shoreline and generally corresponds to 207 acres having the highest European beachgrass cover (61 percent to 100 percent) of the dune restoration area. The Secondary Treatment Area includes the southerly one mile of shoreline and generally corresponds to 73 acres having less European beachgrass cover (less than 61 percent cover). See Figure 2-6 for a map of the Primary and Secondary Treatment Areas.

Removal of European beachgrass within the dune restoration area would be phased temporally and spatially to retain stability along the edges of the treatment area and to provide native vegetation time to re-establish. Removal of European beachgrass from the Primary Treatment Area would occur in two phases over a six-year period. Phase 1 would treat five, approximately 1,300 feet long plots, each spatially separated by approximately 1,300 feet, beginning at the northern boundary of the restoration area. Phase 2 would treat an additional five plots of the same size in areas not treated during Phase 1. Similar to the Primary Treatment Area, removal of European beachgrass from the Secondary Treatment Area would also occur over several years, take advantage of natural breaks in the plant communities, and likely reflect a “spot treatment” approach, rather than removal of European beachgrass from contiguous plots. It is assumed that ongoing invasive plant management

activities would occur for up to ten years or as long as needed to achieve control and/or eradication.

The predominant means of European beachgrass removal would include prescribed burning and/or herbicide application, followed by manual and/or mechanical approaches as the secondary means of removal. The sequencing of prescribed burning and herbicide application has the advantage over mechanical removal because it preserves the remnant European beachgrass stubble and roots as anchoring to retain the semi-stability of the dune system (Pickart 1997). Mechanical removal of European beachgrass could damage the habitat structure and complexity provided by the abundant large wood found on or buried in the dunes; may destabilize the dunes and mobilize sand more quickly than other methods; and potentially result in burial of native dune mat community in the short term. Manual removal of European beachgrass (via hand pulling) is not anticipated to impact dune stability because such removal would target sparse areas of European beachgrass and would be utilized as a means of maintenance following other treatments. Because of the potential for dune destabilization associated with mechanical removal of European beachgrass, burning and herbicide application is the preferred European beachgrass removal method because it retains its rhizomes and roots aiding dune stability while native vegetation establishes in the study area.

In summary, implementation of the Project would not increase the potential for, or magnitude of, liquefaction or collapse, lateral spreading, subsidence, or landslide within the study area. In this regard, Project impacts are considered less than significant. Implementation of the Project would, by design, reduce the stability of sand dunes through removal of European beachgrass. However, the temporal and spatial phasing of the proposed treatments would generally minimize areas of instability and any initial post-treatment instabilities would be temporary. The applied treatments in conjunction with natural dune formation processes are expected to create and maintain a semi-stable dune system similar to that which was present prior to the proliferation of European beachgrass. Native vegetation including dune mat is expected to re-establish quickly (both passively from nearby sources and through augmented plantings), as has been demonstrated by other small- and large-scale projects (Pickart 2008). Therefore, removal of European beachgrass using prescribed burning and herbicide treatments would not create unstable soils, and instead would restore a more mobile dune dynamic that would support a more natural ecosystem similar to what was present prior to the invasion of European beachgrass. Therefore, these Project impacts are considered less-than-significant.

Because of the flat saltmarsh topography and dense-flowered cordgrass removal resulting in generally shallow soil disturbance, such disturbance would not increase the potential for, or magnitude of, soil liquefaction or collapse, lateral spreading, subsidence, or land sliding within the study area. Construction in the tidal marsh portion of the Project would take place from either levees or barges and would not increase soil instability due to the implementation of Mitigation Measures HWQ-1 (Implement Best Management Practices to Protect Water Quality), HWQ-2 (Erosion and Water Quality Control Measures During Channel Excavation and Ground Disturbance), and WQ-6 (Designate Ingress/Egress Routes). Since all Project structures and trails would be designed by a licensed engineer in accordance with

seismic design parameters outlined in the CBC (2019), the risk that structures would collapse during a seismic event would be minimized. Maintenance activities, such as monitoring and trail maintenance, would have no impact on the geologic stability of the Project Area. Therefore, Project construction, invasive plant removal, and normal maintenance activities would not increase the potential for landslide, lateral spreading, subsidence, liquefaction or collapse.

Mitigation Measures: Implement Mitigation Measures HWQ-1, HWQ-2 and WQ-6.

Level of Significance: Less than significant with mitigation.

Impact GEO-4: Would the Project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

Soils in the lower elevation parts of the study area are silty clay loam with a low to medium potential for expansion. Therefore, the potential exists that roadways could be damaged in response to heaving and settlement associated with the shrinking and swelling of the soil. To minimize the risk that structures would fail due to expansive soils, all Project structures, including but not limited to the bridge, box culvert, and non-motorized boat put-in, would be designed by a licensed engineer in accordance with the 2019 CBC.

The Project would enhance recreational opportunities through the construction of trails, and it is anticipated that there would be an increase in use of the Project Area following Project construction. Although the Project Area contains expansive soils, the trails would be located atop existing levees and would be designed in accordance with the CBC (2019). Potential impacts from Project activities in expansive soils are considered less-than-significant because proposed infrastructure would be designed and constructed in conformance with applicable standards to reduce the direct and indirect risk to life or property due to construction on expansive soils.

Mitigation Measure: No mitigation is necessary.

Level of Significance: Less than significant.

Impact GEO-5: 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 within the Project Area. Because the sand dunes are relatively new geologically, and river flooding over the decades has resulted in silt deposits in the tidal and flood prone portions of the Project Area, the likelihood of the Project affecting paleontological resources is low. However, the possibility of encountering a paleontological resource during construction cannot be completely discounted; therefore, the impact related to the disturbance or damage of previously undiscovered paleontological resources, if present, is considered potentially significant.

Mitigation Measures: Implement Mitigation Measure GEO-1.

Mitigation Measure GEO-1: Protect Paleontological Resources during Construction Activities

If fossils are encountered during construction (i.e., bones, teeth, or unusually abundant and well-preserved invertebrates or plants), construction activities within 50 feet (15 meters) of the find shall be stopped. CDFW shall be immediately notified, and a professional paleontologist shall be retained to evaluate the potential resource, assess the nature and importance of the find, and document the discovery as needed. Based on the scientific value or uniqueness of the find, CDFW may allow work to continue after the paleontologist has recorded the find, or may recommend salvage and recovery of the material if it is determined that the find should, but cannot, be avoided. The paleontologist shall make recommendations for any necessary treatment that is consistent with currently accepted scientific practices. CDFW will work with a qualified palaeontologist to determine the appropriate final disposition for any fossils found onsite. The final disposition of any paleontological resources recovered on state lands under the jurisdiction of the State Lands Commission must be approved by the State Lands Commission.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measure GEO-1 would reduce potentially significant impacts on undiscovered paleontological resources to a less-than-significant level by: 1) providing a process for evaluation of any resources encountered during construction, and 2) either avoidance or recovery of resources consistent with appropriate laws and requirements.

3.6.6 Cumulative Impacts

Impact GEO-C-1: Would the Project contribute to a cumulatively significant impact to geology and soils?

The nature of geologic impacts is largely site-specific. Therefore, geologic hazards do not accumulate as impacts as other resources do. The Project would comply with state regulations and policies; and design standards would be implemented to reduce the direct and indirect risk to life or property from potential geologic hazards. Mitigation Measures HWQ-1, HWQ-2 and WQ-6 would be implemented to reduce potentially significant impacts from Project-related soil erosion or soil instability to a less-than-significant level, and Mitigation Measure GEO-1 would be implemented to reduce potentially significant impacts on undiscovered paleontological resources to a less-than-significant level. With implementation of these mitigation measures, the Projects contribution to cumulative impacts would not be considerable, and therefore cumulative impacts on geology and soils would be less than significant.

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant.

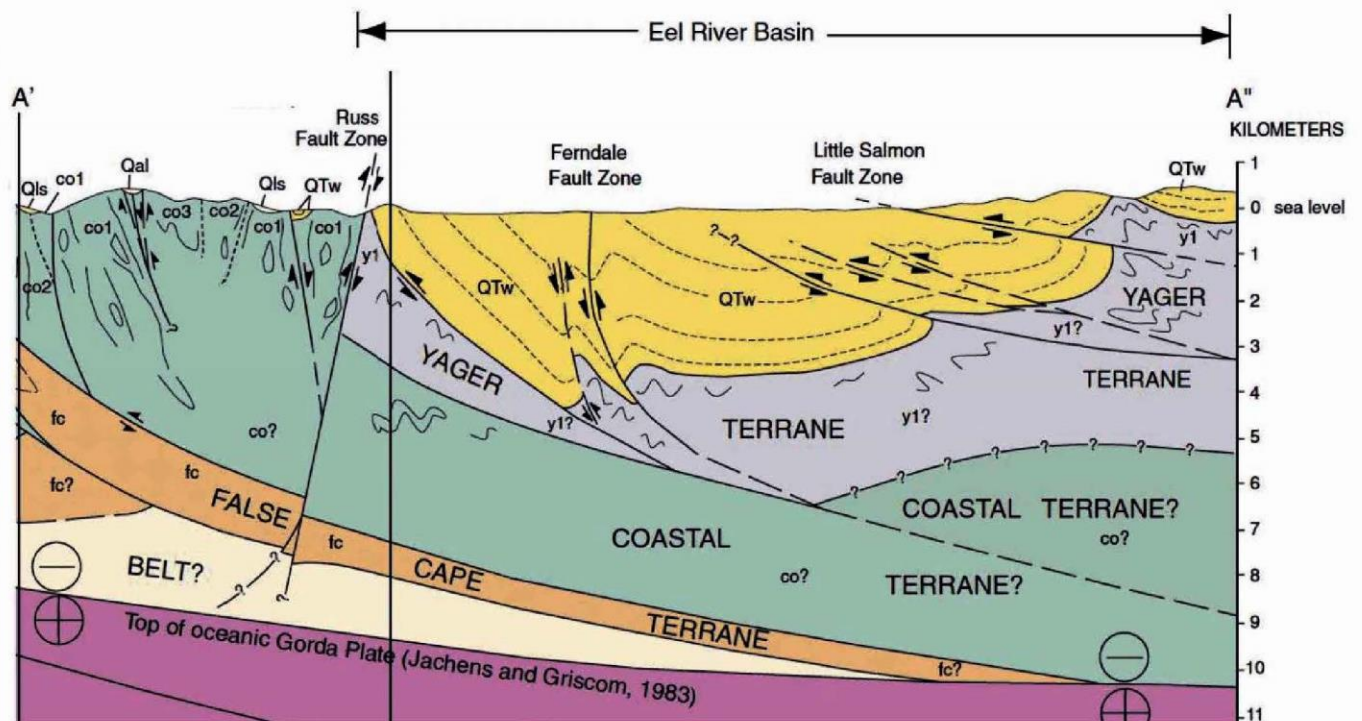
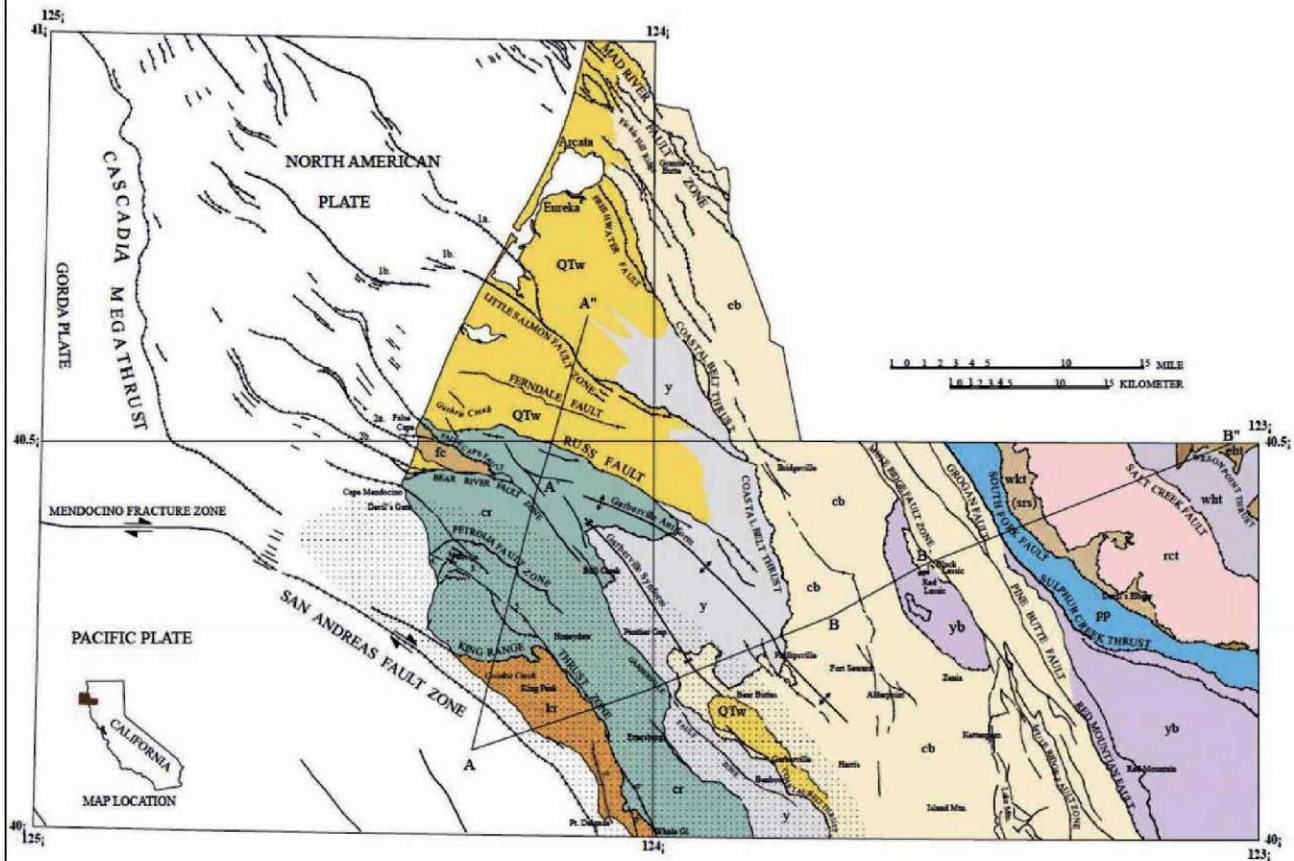
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Regional Geology of Eel River coastal plain. Alignment of cross-sectional profile A-A' (lower graphic) is indicated in upper graphic. Formation abbreviations: QTW - marine and non-marine siltstone, sandstone, and mudstone; y1 - sheared and highly folded mudstone of the Yager terrane; co - highly folded and sheared sandstone, mudstone (mélange) of the Coastal terrane; and fc - thin-bedded sandstone and limestone of the False Cape terrane. Data and Figure Modified from McLaughlin et al., 2000, and cited from KHE 2015.



California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/25/2020

Regional Geologic Setting

FIGURE 3.6-1



Paper Size ANSI A

0 0.3 0.6 0.9 1.2

Miles



California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/22/2020

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

Shoreline Accretion and Erosion Trends
Eel River Segments

FIGURE 3.6-2

3.7 Greenhouse Gas Emissions

This section evaluates potential impacts related to greenhouse gas (GHG) emissions during construction, invasive plant management and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. Potential impacts from public access related to GHG emissions are also considered in this section. The study area for this section includes the Project Area and adjacent lands where sensitive receptors may be impacted by construction, invasive plant management or maintenance-related GHG emissions that would potentially occur from the Project.

3.7.1 Setting

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 (CO₂), methane (CH₄), nitrous oxide (N₂O), ozone (O₃), and water vapor (H₂O).

While GHGs in the atmosphere are naturally occurring, the emission rate of CO₂, CH₄ and N₂O has been accelerated by human activities. Emissions of CO₂ are largely a by-product of fossil fuel combustion, whereas CH₄ 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. Greenhouse gases are typically reported in carbon-dioxide-equivalent measures (CO₂e), as each GHG has a different global warming potential.

The study area is located within a rural area generally comprised of agricultural land, undeveloped riverine floodplains, freshwater and estuarine wetlands, and single-family residences. Although agricultural activities do generate GHG emissions, the amount of active dairies or other similar uses within the study area is limited. Additionally, due to the rural nature of the study area, the demand for fossil fuels in the form of transportation is low. The majority of trips are associated with traveling to areas for recreational purposes, residents traveling to their respective homes and/or ranches, and maintenance of infrastructure and habitats in the Project Area. No other major sources of GHG emissions exist in the study area.

3.7.2 Regulatory Framework

Federal

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the Clean Air Act (CAA). The U.S. Supreme Court ruled on April 2, 2007 that CO₂ is an air pollutant under the CAA, and that EPA has the authority to regulate emissions of GHGs. For long-term actions that have annual direct emissions of less than 25,000 metric tons of carbon-dioxide-equivalents (MTCO₂e), the Council on Environmental Quality (CEQ) previously encouraged federal agencies to consider whether the action's long-term emissions should receive similar analysis. The CEQ's 2016 final guidance removed direct emissions criteria and contains no numeric recommendations.

State

Executive Order S-3-05

In 2005, the Governor of California signed Executive Order (EO) S-3-05, which established GHG emission reduction targets to reduce emissions as follows:

- By 2010, reduce GHG emissions to 2000 levels
- By 2020, reduce GHG emissions to 1990 levels
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

Assembly Bill 32, California Global Warming Solutions Act of 2006

In 2006, the Governor of California signed the Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32), committing California to reducing GHG emissions to 1990 levels by 2020. The statute requires the California Air Resources Board (CARB) to track emissions through mandatory reporting, determine the 1990 emission levels, set annual emissions limits that would result in meeting the 2020 target, and design and implement regulations and other feasible and cost effective measures to ensure that statewide GHG emissions would be reduced to 1990 levels by 2020. CARB calculated the 2020 emissions limit as 431 million metric tons (MMT) CO₂e. Projected business-as-usual emissions for 2020 are 509 MMT CO₂e. A reduction of 78 MMT CO₂e is needed to meet the goal (CARB 2012).

Executive Order B-30-15

On April 29, 2015, the Governor of California announced EO B-30-15 and established the 2030 target of reducing GHG emissions to 40 percent below 1990 levels. The emission reduction target is an interim-year goal to provide substantial progress toward the ultimate goal of reducing emissions by 80 percent below 1990 levels by 2050.

Senate Bill 32 and Assembly Bill 197

Senate Bill (SB) 32, passed in 2016, extended the goals of AB 32 and codifies the GHG reduction target of 40 percent below 1990 levels by year 2030, consistent with EO B-30-15. The companion bill to SB 32, AB 197, provides additional direction to CARB in developing each update to the Climate Change Scoping Plan (see below).

Climate Change Scoping Plan

In December 2008, pursuant to AB 32, CARB adopted the Climate Change Scoping Plan (Scoping Plan), which outlined measures to attain the 2020 GHG emissions limit. The Scoping Plan estimated that implementation of identified measures would result in a reduction of 105.3 MMT CO₂e from various sectors. AB 32 requires CARB to update the Scoping Plan at least every five years. The 2017 Scoping Plan does not contain a recommended reduction level or percent for local government's municipal operations. However, the 2017 Scoping Plan does describe CARB's recommended statewide per-capita emissions targets for 2030 and 2050, and further details how local land-use agencies may derive quantitative locally-appropriate community-wide per capita emissions targets that align with the statewide targets.

Regional and Local

North Coast Unified Air Quality Management District

The North Coast Unified Air Quality Management District (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, NCUAQMD adopted Rule 111 (Federal Permitting Requirements for Sources of Greenhouse Gases) into the District rules and thus established a threshold above which New Source Review (NSR) and federal Title V permitting applies. Rule 111 also established federally enforceable limits on GHG emissions 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, or established CEQA significance criteria specific to evaluating the effects of project-related GHG emissions.

Humboldt County

Portions of the study area (i.e., areas outside of the Project Area that are not owned by CDFW) are subject to local oversight and compliance with the Humboldt County General Plan and Eel River Area Local Coastal Plan. The County released a draft Climate Action Plan in January 2012, which contains an emissions inventory and forecast. The draft Climate Action Plan also includes a proposed emissions reduction target. However, the County has not yet adopted the Climate Action Plan.

The goals and policies within the Humboldt County General Plan that regulate GHG emissions include the following:

AQ-G4. Greenhouse Gas Emissions

Successful mitigation of GHG emissions associated with this Plan to levels of non-significance as established by the Global Warming Solutions Act and subsequent implementation of legislation and regulations.

AQ-P1. Reduce Length and Frequency of Vehicle Trips

Reduce the length and frequency of vehicle trips through land use and transportation policies by encouraging mixed-use development, compact

development patterns in areas served by public transit, and active modes of travel.

AQ-P9. County Climate Action Plan

Through public input and review, develop and implement a multi-jurisdictional Climate Action Plan to achieve reductions in GHG emissions consistent with the state Global Warming Solutions Act and subsequent implementing legislation and regulations.

AQ-11. Review of Projects for Greenhouse Gas Emission Reductions

The County shall evaluate the GHG emissions of new large-scale residential, commercial and industrial projects for compliance with state regulations and require feasible mitigation measures to minimize GHG emissions.

Eel River Area Local Coastal Plan

No GHG regulations are listed or discussed in the Eel River Area Local Coastal Plan.

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 GHG 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 GHGs.

3.7.4 Methodology

The NCUAQMD has not adopted regulations regarding the evaluation of GHG emissions in a CEQA document, and has not established CEQA significance criteria to determine the significance of impacts with regard to GHGs (J. Davis. pers. comm. 2019). The NCUAQMD recommends considering the GHG emission CEQA standards from the Bay Area Air Quality Management District (BAAQMD) (J. Davis pers. comm. 2019). However, the BAAQMD does not contain quantitative GHG emission thresholds for Project construction (BAAQMD 2017). Therefore, due to a lack of local thresholds, this impact analysis applies the CARB's industrial Cap-and-Trade threshold of 25,000 MTCO_{2e} per year to determine the Project's impact for generation of GHGs.

This threshold is also consistent with the EPA's Greenhouse Gas Reporting Program reporting threshold for 'large' industrial sources. This threshold was selected after review of multiple threshold options. The BAAQMD has adopted quantitative thresholds of significance for project operations. However, the BAAQMD's 'bright line' threshold was determined to not be appropriate for the proposed Project, as the threshold was developed using a 'gap-based approach' covering land use development. Land use development includes typical commercial and residential development, but not restoration projects. As stated by the BAAQMD:

This approach is intended to attribute an appropriate share of GHG emission reductions necessary to reach AB 32 goals to new land use development projects in BAAQMD's jurisdiction that are evaluated pursuant to CEQA. (BAAQMD 2009)

The CARB's industrial Cap-and-Trade threshold of 25,000 MTCO_{2e} per year was determined to be the most appropriate threshold for the Project, as it is not tied to land use development growth associated with a specific region, but applies state-wide. Additionally, the state requires participation in the Cap-and-Trade program for covered facilities with emissions in excess of the threshold.

California Emissions Estimator Model, CalEEMod, (Version 2016.3.2) was used to estimate air pollutant emissions from Project construction, invasive plant management and maintenance activities. The construction emissions modelling was based on the construction equipment inventories, schedule, and estimated hauling quantities developed for the Project. Greenhouse gas emissions from the proposed prescribed burning of 279 acres (113 hectares) of European beachgrass and 571 acres (231 hectares) of dense-flowered cordgrass was estimated using the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) Equation 101, Category 3C1c (Biomass Burning in Grassland).

In order to assess the potential impact of construction-generated emissions and prescribed burning, the construction and prescribed burning GHG emissions were annualized over an assumed 30-year Project lifespan and added to estimated invasive plant management and maintenance emissions.

Post-construction Project emissions were also estimated using CalEEMod to evaluate emissions from invasive plant management activities, site maintenance, and use of the Project Area by the public, at an assumed rate of six trips per day. These emissions were modelled for year 2 of construction. It was assumed that ongoing invasive plant management activities include the use of up to three pieces of heavy equipment, including excavators, backhoes, and/or marshmasters, as well as off-road vehicles for site access.

3.7.5 Impacts and Mitigation Measures

Impact GG-1: Would the Project generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

As described above, there are no local thresholds for evaluating GHG emissions. As a result, CARB's industrial Cap-and-Trade threshold of 25,000 MTCO_{2e} per year was used to evaluate Project impacts from generation of GHGs during construction, invasive plant management, and maintenance activities.

Project construction activities would result in a temporary increase in GHG emissions, including exhaust emissions from on-road trucks, worker commute vehicles, and off-road heavy-duty equipment. Construction would require clearing, earthmoving, and operation of 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 were estimated to be

approximately 990 MTCO₂e from all construction activities over the two-year construction period. Annualized construction emissions equal 33 MTCO₂e/year.

It is assumed that ongoing invasive plant management activities would occur for up to ten years or as long as needed to achieve control and/or eradication. Invasive plant management activities would generate an estimated 1,533 MTCO₂e and 750 MTCO₂e from prescribed burning of European beach grass and dense-flowered cordgrass, respectively, over a ten year treatment period. Annualized prescribed burning emissions equal 51 MTCO₂e/year and 25 MTCO₂e/year for European beach grass and dense-flowered cordgrass, respectively. Invasive plant management would also generate an estimated annual 15 MTCO₂e from machinery use. If invasive plant management activities were to persist beyond ten years, the annualized emissions would remain the same.

Table 3.7-1—Greenhouse Gas Pollutant Emissions summarizes Project construction, invasive plant management, maintenance and public access-related GHG emissions model results. Cumulatively, Project emissions total well below the established 25,000 MTCO₂e per year threshold.

Emissions during construction would not be a considerable contribution to the cumulative GHG impact, given that construction would be temporary, of short duration, and would not require a large fleet of earthmoving equipment and soil off hauling. Additionally, invasive plant management, maintenance, and public access emissions would not exceed the identified emission thresholds. Accordingly, the Project would not result in substantial long-term emissions of GHGs and would result in a less than significant impact.

Table 3.7-1. Greenhouse Gas Pollutant Emissions

Parameter	Emissions (metric tons per year)
Mobile (Trips to Project Site for invasive plant management, maintenance, and public access)	92
Invasive Plant Management (Off-road equipment)	15
Annualized Prescribed Burning (European beach grass)	51
Annualized Prescribed Burning (dense-flowered cordgrass)	25
Annualized Construction	33
Total	216
<i>Threshold of Significance</i>	<i>25,000</i>
<i>Significant Impact (Yes/No)</i>	<i>No</i>

Notes: Table 3.7-1 includes estimated emissions from Project activities annualized over a 30 year period. The emissions are presented in metric tons per year based off of estimated annual emissions, assuming a 30 year period.

The Project would result in an increase in coastal and salt marsh wetland habitat. A recent summary of existing data (William et al. 2009) suggests that freshwater wetlands, riparian forest, brackish wetlands, and salt marsh all have high rates of carbon sequestration. However, wetlands also produce methane, which is a potent GHG, during anaerobic decomposition in low-salinity, saturated soils. Methods for measuring carbon sequestration and methane production in wetlands are just becoming standardized.

According to the IPCC's 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories – Wetlands:

Rewetting can also restore wetlands to a state where net CO₂ emissions are greatly reduced or even become negative, causing the wetlands to function as a net remover of greenhouse gases from the atmosphere. (IPCC 2013)

The amount of GHGs produced or sequestered for any given wetland or wetland restoration project is in large part determined by the type of wetland and other site-specific conditions. For instance, the carbon sequestration benefit of freshwater wetlands is offset by their production of methane. Seasonal wetlands and riparian habitat produce less methane than perennial freshwater wetlands because they dry out during summer when methane production in saturated soils is greatest, due to anoxic conditions (Williams et al. 2009). While mudflats produce little methane, they also sequester less carbon. Therefore, restoring salt marsh and brackish wetlands is an effective means to sequester carbon while reducing methane emissions.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact GG-2: Would the Project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs?

The Project was evaluated for consistency with the CARB 2017 Climate Change Scoping Plan. The Scoping Plan provides California's climate policy portfolio and recommended strategies to put the state on a path to achieve the 2030 target. The scenario includes ongoing and statutorily required programs, continuing the Cap-and-Trade Program, and high-level objectives and goals to reduce GHGs across multiple economic sectors.

The Project would cause a temporary increase in GHGs; however, invasive plant management, maintenance and public access emissions would not exceed the identified emission thresholds, as shown in Impact GG-1. Table 3.7-2 summarizes the Project's consistency with the 2017 Climate Change Scoping Plan.

Table 3.7-2. Consistency Analysis Between Project and Climate Change Scoping Plan

Scoping Plan Reduction Measures	Consistency/Applicability Determination
<p>California Cap-and-Trade Program Linked to Western Climate Initiative. Implement a broad-based California Cap-and-Trade program to provide a firm limit on emissions. Link the California cap-and-trade program with other Western Climate Initiatives. Partner programs to create a regional market system to achieve greater environmental and economic benefits for California. Ensure California's program meets all applicable AB 32 requirements for market-based mechanisms.</p>	<p>Not Applicable. This reflects the adoption of a state-wide measure that cannot be implemented by the lead agency. The Project would not include facilities or emissions sources subject to this measure.</p>
<p>California Light-Duty Vehicle GHG Standards. Implement adopted standards and planned second phase of the program. Align zero-emission vehicle, alternative and renewable fuel and vehicle technology programs with long-term climate change goals</p>	<p>Not Applicable. This reflects the adoption of a state-wide standard that cannot be implemented by the lead agency.</p>
<p>Energy Efficiency. Maximize energy efficiency building and appliance standards; pursue additional efficiency including new technologies, policy, and implementation mechanisms. Pursue comparable investment in energy efficiency from all retail providers of electricity in California.</p>	<p>Not Applicable. This is a measure for the state to increase its energy efficiency standards in new buildings. The Project would not include buildings or facilities.</p>
<p>Renewable Portfolio Standard. Achieve 33 percent renewable energy generation mix statewide. Renewable energy sources include (but are not limited to) wind, solar, geothermal, small hydroelectric, biomass, anaerobic digestion, and landfill gas.</p>	<p>Not Applicable. This reflects the adoption of a statewide standard that cannot be implemented by the lead agency. The Project would not include energy-utilizing facilities.</p>
<p>Low Carbon Fuel Standard. Develop and adopt the Low Carbon Fuel Standard.</p>	<p>Not Applicable. This reflects the adoption of a state-wide standard that cannot be implemented by the lead agency. When this measure is initiated, the standard would be applicable to the fuel used by</p>

Scoping Plan Reduction Measures	Consistency/Applicability Determination
Regional Transportation-Related GHG Targets. Develop regional GHG emissions reduction targets for passenger vehicles. This measure refers to SB 375.	Not applicable. This is a statewide measure calling for the development of GHG emission reduction targets that cannot be implemented by the lead agency.
Vehicle Efficiency Measures. Implement light-duty vehicle efficiency measures.	Not applicable. This reflects the adoption of a statewide standard that cannot be implemented by the lead agency.
Goods Movement. Implement adopted regulations for the use of shore power for ships at berth. Improve efficiency in goods movement activities.	Not applicable. The Project does not propose any changes to modes of transportation of goods.
Million Solar Roofs Program. Install 3,000 megawatts (MW) of solar-electric capacity under California's existing solar programs.	Not Applicable. This measure is intended to increase solar power throughout California, which is being done by various utility companies and solar programs. The Project would not include energy-utilizing facilities that could utilize solar power.
Medium/Heavy-Duty Vehicles. Adopt medium and heavy-duty vehicle efficiency measures.	Not applicable. This reflects the adoption of a statewide standard that cannot be implemented by the lead agency.
Industrial Emissions. Require assessment of large industrial sources to determine whether individual sources within a facility can cost-effectively reduce GHG emissions and provide other pollution reduction co-benefits. Reduce GHG emissions from fugitive emissions from oil and gas extraction and gas transmission. Adopt and implement regulations to control fugitive methane emissions and reduce flaring at refineries.	Not applicable. This measure would apply to the direct GHG emissions at major industrial facilities. The Project is not industrial.

Scoping Plan Reduction Measures	Consistency/Applicability Determination
High Speed Rail. Support implementation of a high-speed rail system.	Not applicable. This is a state-wide measure that cannot be implemented by the lead agency.
Green Building Strategy. Expand the use of green building practices to reduce the carbon footprint of California's new and existing inventory of buildings.	Not Applicable. The Project would not include buildings that could utilize green building practices.
High Global Warming Potential Gases. Adopt measures to reduce high global warming potential gases.	Not Applicable. This measure is applicable to the high global warming potential gases such as hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride found in air conditioning and commercial refrigerators. The Project would not include such equipment.
Recycling and Waste. Reduce methane emissions at landfills. Increase waste diversion, composting, and commercial recycling. Move toward zero-waste.	Not Applicable. The Project does not include a landfill and would not generate a notable amount of waste that would need to be placed in a landfill.
Sustainable Forests. Preserve forest sequestration and encourage the use of forest biomass for sustainable energy generation.	Not Applicable. The Project Area is not and would not be forested.
Water. Continue efficiency programs and use cleaner energy sources to move and treat water.	Not Applicable. The Project would not move or treat water.
Agriculture. In the near-term, encourage investment in manure digesters and at the five- year Scoping Plan update determine if the program should be made mandatory by 2020.	Not applicable. The Project does not include agricultural production.

Source of Scoping Plan Reduction Measures: CARB 2008

As described in Table 3.7-2, the Project is consistent with AB 32, as outlined in the 2008 and 2017 Climate Change Scoping Plans. Therefore, the Project would have no impact on a plan, policy or regulation adopted for the purposes of reducing GHG emissions.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.7.6 Cumulative Impacts

Impact GG-C-1: Would the Project contribute to a cumulatively significant impact relative to GHG 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 represents the cumulative analysis for impacts from GHG emissions. Any increases in Project-related GHG emissions would not impede the state in meeting AB 32 GHG reduction goals (as implemented through the Scoping Plan). The Project would not contribute to a significant impact related to GHG emissions.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.7.7 References

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3.8 Hazards and Hazardous Materials

This section evaluates the potential impacts related to hazards and hazardous materials during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The study area for this section includes the Project Area and adjoining properties/waterbodies that may be impacted by the use of hazardous materials under the Project.

3.8.1 Setting

Site Description

Historical Use of the Project Area

Historical use information on the Project Area was determined using U.S. Geological Survey (USGS) topographic maps, zoning records, and aerial photos from the Humboldt County Department of Public Works Natural Resources in Eureka, California. Aerial photographs from 1939, 1948, 1954, 1958, 1965, 1970, 1981, 1988, 1993, 2005, 2012, and 2016 were reviewed to visually evaluate the historical use of the Project Area. Review of the aerial photographs indicated that the site has remained largely undeveloped open ranch land. All structures currently in the Project Area are evident in the reviewed aerial photographs. Existing roads are evident in the aerial photographs and the roads do not appear to have historically deviated from their current alignments.

Historical Use of Adjacent Property

Historical land use on adjoining properties was determined using the aerial photographs described above. Properties to the north and east have been used for agriculture, specifically cattle ranching, for decades. These properties remain in agricultural use today and only a handful of structures (such as barns and farmhouses) are visible east of the Project Area. Land to the west is undeveloped beachfront and dune habitat. There is no evidence in the reviewed historical aerial photographs of industrial, manufacturing or large-scale residential use of any kind at the Project Area, or on contiguous lands.

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 California Code of Regulations (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 the 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.

Hazardous Materials in the Study Area

Federal, state, tribal and local regulatory agency databases were searched by Environmental Data Resources, Inc (EDR), an independent database search service for identifying known hazardous materials locations, in October 2018. An area-wide EDR database query was conducted with a search distance extending approximately one mile beyond the Project Area boundary. Results of the records search indicated that the Project Area is not listed among any of the government records examined (EDR 2018). A supplemental Cortese List record search was conducted on October 3, 2018 by GHD. Results of the Cortese List records search also determined that the Project Area is not listed among the government records examined.

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 dermal absorption, inhalation, and ingestion of tainted air, water, or food. Depending on the magnitude, frequency, and duration, human exposure to hazardous materials can cause a variety of health affects ranging from short-term acute symptoms to long term chronic effects. The principal 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. The closest school to the Project Area is Loleta Elementary School which is approximately 3.6 miles southeast of the Project Area eastern boundary. There are approximately six residential structures along Indianola Reservation Road, located northeast of the Project Area, the nearest located approximately 350 feet (107 meters) northeast of the Area D boundary and approximately 3,600 feet (1,097 meters) east of the Area A boundary. The next closest occupied residential structures to the Project Area

are associated with the Wiyot Table Bluff Reservation, which is located approximately 0.6 mile northeast of the Project Area. The third closest residential area is the community of Loleta, located approximately 3.5 miles southeast of the Project Area.

Fire Hazards

The study area is within the Loleta 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. The California Department of Forestry and Fire Protection (CAL FIRE) identifies fire hazard severity zones and Local Responsibility Areas (LRA) throughout California. The study area is designated as an unincorporated LRA. The primary fire hazard severity zone applied to the study area is LRA Unzoned, with segments of the north and central portions of the Project Area designated as LRA Moderate (CAL FIRE 2008).

Airports

The closest public airport to the study area is Samoa Field, located on the Samoa Peninsula approximately 6.5 aerial miles north-northeast from the northern boundary of the Project Area. The second closest airport is Rohnerville Airport, located south of the City of Fortuna, approximately 11 aerial miles southeast of the Project Area. There are no private airfields in the Project vicinity.

3.8.2 Regulatory Framework

Hazardous materials and hazardous wastes are subject to federal, state, and local laws and regulations intended to protect public health and safety and the environment. The U.S. Environmental Protection Agency (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 (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 and the study area is the Humboldt County Division of Environmental Health.

Federal

The primary federal agencies with responsibility for hazardous materials management are the EPA, OSHA, and the DOT. Federal laws, regulations, and responsible agencies relevant to the Project are summarized in Table 3.8-1.

Table 3.8-1 Federal 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 (CERCLA) (amended by SARA 1986 and Brownfields Amendments 2002)	Regulates the clean-up of sites contaminated by releases of hazardous substances.
Hazardous Materials Transportation and Handling	U.S. Department of Transportation	Regulates 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	OSHA sets standards for safe workplaces and work practices, including the reporting of accidents and occupational injuries (29 CFR).

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 clean-up 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.

Section 30232 (Oil and hazardous substance spills) of the California Coastal Act of 1976 (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 clean-up facilities and procedures shall be provided for accidental spills that do occur.

The DTSC'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).

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 California Department of Transportation (Caltrans).

Occupational Safety

Worker health and safety is regulated at the federal level by 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. The DTSC and Cal/OSHA are the agencies that are responsible for overseeing that appropriate measures are taken to protect workers from exposure to potential soil or groundwater contaminants.

Emergency Response

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local government agencies. Responding to hazardous materials incidents is a part of this plan. The plan is administered by the State Office of Emergency Services, which coordinates the responses of other

agencies such as local fire and police agencies, emergency medical providers, CHP, 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.

Fire Regulation

State fire safety regulations that apply to activities proposed under the Project 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 (3 meters) from any equipment that could produce a spark, fire, or flame, and the construction contractor must 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 (7 meters) of any flammable materials (PRC Section 4431).

CAL FIRE also provides oversight for all prescribed burning in the study area.

Water Quality

The Porter Cologne Water Quality Control Act (Porter-Cologne) is the primary state statute for protection of water quality in California. Under Porter-Cologne, the nine Regional Water Quality Control Boards (RWQCBs), with oversight from the SWRCB, regulate discharges to waters of the State based on the regulatory standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region. The North Coast RWQCB has regulatory oversight of the study area, with standards and objectives provided in the Water Quality Control Plan for the North Coast Region (NCRWQCB 2018).

Responsibility for implementation of Section 402 of the Clean Water Act has also been delegated to the SWRCB/RWQCBs, where they implement and enforce permits that fall under the National Pollutant Discharge Elimination System (NPDES). The 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) applies to discharges from 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. The Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (Order No. 2013-0002-DWQ) applies to any pesticide applications at aquatic sites that will result in discharges to Waters of the U.S, including the use of imazapyr.

The Coastal Act set policies related to management of resources in California's coastal zone. The policies of the Coastal Act constitute the statutory standards applied to planning and regulatory decisions made by the California Coastal Commission (CCC), pursuant to the Coastal Act. Hazardous substances are addressed in Chapter 3, Section 30232 (Oil and hazardous substance spills) of the Coastal Act. Per Section 30232 of the Coastal Act, "(p)rotection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and clean-up facilities and procedures shall be provided for accidental spills that do occur" (CCC 1976).

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore are not subject to local permitting requirements (i.e., Conditional Use Permit) from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. The portions of the study area that extend beyond the Project Area boundary, including adjacent properties, would be subject to local regulation, including the following Humboldt County plans.

Humboldt County Operational Area Hazard Mitigation Plan

The 2014 Humboldt County Operational Area Hazard Mitigation Plan Update is the county's plan to identify and reduce hazards before any type of hazard event occurs (Humboldt County 2014). The Hazard Mitigation Plan aims to reduce losses from future disasters such as dam failure, drought, earthquake, fish losses, flooding, landslide, severe weather, tsunami, and wildfire. The Hazard Mitigation Plan also includes a vulnerability analysis and proposed initiatives designed to minimize future hazard-related damage.

Humboldt County Emergency Operations Plan

The 2015 Humboldt County Emergency Operations Plan (EOP) for the Humboldt Operational Area addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Humboldt County (Humboldt County 2015). The EOP 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 activities, and the recovery process.

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 create a significant hazard to the public or the environment;
- 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, where the Project could result in a safety hazard or excessive noise 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, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires.

Areas of No Project Impact

As explained below, construction, invasive plant management, and maintenance activities under 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? The closest school to the study area is Loleta Elementary School which is located approximately 3.5 miles southeast of the Project Area's eastern boundary. As there are no schools located within 0.25 mile of the study area, this significance criterion is not applicable and is not 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 create a significant hazard to the public or the environment? The EDR Area/Corridor Report prepared for this Project does not identify any hazardous materials sites within the Project Area, or within a search area buffer of 1-mile (EDR 2018). A supplemental Cortese List record search was conducted on October 3, 2018 by GHD. Results of the Cortese List records

search determined that the Project Area is not listed among the government records examined. As the Project Area is not located on a hazardous materials site listed per Section 65962.5, this significance criterion is not applicable 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 study area is not located within an airport land use plan or within two miles of a public airport. Therefore, this significance criterion is not applicable 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 study area is located within a Tsunami Evacuation Zone and within a 100 year FEMA Flood Zone. Portions of the Project Area, specifically along McNulty Slough, are currently subject to regular inundation during high tides. Tsunami warning signage is present along Table Bluff Road, north and east of the Project Area entrance. The Wiyot Tribe has developed an Emergency Operations Plan which is intended to aid the Wiyot Table Bluff Reservation, located northeast of the Project Area, outside the Tsunami Evacuation Zone and Table Bluff community in the event of a disaster. Implementation of the Project would not impair implementation of or physically interfere with the existing tsunami evacuation route.

The Project Area is undeveloped, with the exception of an unpaved road. Immediately adjacent to the Project Area boundary near the unpaved access road are a vacant wooden barn, and associated remnant corrals, and pens. The Project Area is uninhabited, and the Project does not propose to construct habitable structures. The proposed road, parking area, and trail establishment could aid in emergency response access and evacuation from the Project Area. The Project would not impair access to the Project Area during or after construction and would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Therefore, this significance criterion is not applicable and is not discussed further in this Draft EIR.

3.8.4 Methodology

As described above, the study area for the impact analysis includes the Project Area, as well as the adjoining properties/waterbodies that may be impacted by the use of hazardous materials or herbicide under the Project. The roadway alignments that provide access to the Project Area are Table Bluff Road from the Project Area east to the intersection with Hookton Road, and Hookton Road from Table Bluff Road intersection east to U.S. Highway 101.

This analysis considers the range and nature of foreseeable hazardous materials use, storage, disposal and fire treatment methods resulting from the proposed Project and identifies the primary ways that hazardous materials and fire treatment

methods 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 Area:

- Area/Corridor Report for the Project Area (EDR 2018);
- Supplemental Cortese List record search (GHD 2018);
- Available literature, including documents published by county, state and federal agencies; and
- Prior EIRs for the area (i.e., Eel River Ecosystem Restoration Project, Final Programmatic EIR for the Humboldt Bay Regional Spartina Eradication Plan (2013 Spartina PEIR)).

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, invasive plant management and maintenance activities to be completed under the Project would be required to 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?

General Construction Materials

Construction of the Project includes the transport and use of common hazardous materials inherent to the construction process, including petroleum products and solvents for construction equipment and vehicles. These materials are commonly used during construction, are not acutely hazardous, and would be used in relatively small quantities. Contractor(s) would be required to comply with all applicable 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.

Herbicide Application for Invasive Plant Management

Invasive plant management activities would include the use of herbicide (imazapyr) during discrete periods to treat areas of dense-flowered cordgrass and/or European beachgrass. Use of herbicide would be a secondary treatment method and would be applied in conjunction with a primary treatment method, such as burning, mowing or grinding (see Chapter 2, Project Description).

Herbicide Application for Dense-Flowered Cordgrass Management

Proposed treatment methods for dense-flowered cordgrass, including the use of herbicide, would be consistent with those outlined in the Humboldt Bay Regional

Spartina Eradication Plan (H.T. Harvey 2013). A summary of the potential risk posed by imazapyr to humans and the environment, including what is described in the Humboldt Bay Regional Spartina Eradication Plan EIR (H.T. Harvey and GHD 2013), is provided below.

Imazapyr is an herbicide active ingredient approved for aquatic use, and which has been used to control non-native Spartina in the San Francisco Bay since 2006. Fate and transport studies have determined that imazapyr poses no significant risk to aquatic environments, as it is rapidly degraded by photolysis with a half-life averaging 2 days (Nufarm Americas Inc. 2020).

Imazapyr is a slow-acting, systemic, broad-spectrum, pre- and post-emergent herbicide that effectively controls grasses and many broadleaf species. As such, this herbicide will affect most terrestrial vegetation it is in contact with at sufficient concentrations, including non-target vegetation. Overspray, drift, accidental spills or off-target discharge that may occur as a result of herbicide treatments could, therefore, result in impacts to desirable vegetation in the Project Area.

Other general concerns with herbicide use focus on the risk to wildlife and human health. Imazapyr inhibits the enzyme acetolactate synthase in plants, blocking the production of three essential amino acids (valine, leucine, and isoleucine) (Washington DOE 2009). This enzyme is not present in animals. EPA has categorized imazapyr as “practically non-toxic” to birds and mammals (UEPA 2016). The prescribed application rate of imazapyr does not result in aquatic or terrestrial concentrations that exceed screening levels for toxicity to wildlife. Risk for bioaccumulation is low because it is highly soluble in water and has low solubility in lipids, meaning it does not concentrate in animal fat or organ tissue. Therefore, the application of this herbicide would not impact the study area environment through food web exposure.

Hazards to herbicide mixers, loaders, applicators or to the public include the potential for direct exposure to herbicide products. Direct exposure to herbicide formulations containing imazapyr may result in mild skin irritation or other biological symptoms (Nufarm Americas Inc. 2020; SePRO Corporation 2016). Mild eye irritation can also occur if imazapyr is accidentally splashed while it is being mixed, loaded, or applied.

If not properly managed or applied, the use of imazapyr for treatment of dense-flowered cordgrass could result in hazards to the environment, such as non-target vegetation, or the public, including the herbicide applicators or anyone that may come into direct contact with it. The impact is considered significant.

Herbicide Application for European Beachgrass Management

The application of herbicide to European beachgrass would generally follow the same protocol as those used to address dense-flowered cordgrass, as outlined in the 2013 Spartina PEIR (H.T. Harvey and GHD 2013). As described above, use of herbicide, if not properly managed or applied, could result in hazards to the environment (such as non-target vegetation) or the public (including the herbicide applicators or anyone that may come into direct contact with it). The potential impact is considered significant.

Mitigation Measures: Implement Mitigation Measures HHM-1, HHM-3, and HHM-4.

In accordance with CEQA Guidelines Section 15150, an EIR may incorporate by reference all or portions of another document which is a matter of public record or is generally available to the public. Where all or part of another document is incorporated by reference, the incorporated language shall be considered to be set forth in full as part of the text of the EIR. The Project would implement the following mitigation measures, as defined in the 2013 Spartina PEIR (H.T. Harvey and GHD 2013), for application of herbicide on dense-flowered cordgrass. The 2013 Spartina PEIR measures have been slightly adapted to reflect that their implementation would also apply to treatment of European beachgrass, and to other Project activities that would result in comparable potential impacts to health and safety (e.g., use of equipment to implement the tidal restoration component of the project).

Mitigation Measure HHM-1: Worker Injury from Accidents Associated with Use of Manual and Mechanical Equipment.

A health and safety plan shall be developed to identify and educate workers engaged in activities that involve heavy equipment associated with construction or invasive plant management activities under the Project. Appropriate safety procedures and equipment, including hearing, eye, hand and foot protection, and proper attire, shall be used by workers to minimize risks associated with use of heavy equipment. Workers shall receive safety training appropriate to their responsibilities prior to engaging in such work.

Mitigation Measure HHM-3: Worker Health Effects from Herbicide Application.

Appropriate health and safety procedures and equipment, as described on the herbicide or surfactant label, including personal protective equipment (PPE) as required, shall be used by workers to minimize risks associated with herbicide application methods. Mixing and applying herbicide will be done in accordance with label directions and shall be conducted or supervised by certified or licensed herbicide applicators.

Mitigation Measure HHM-4: Avoid Health Effects to the Public and Environment from Herbicide.

For areas targeted for application of herbicide that are within 500 feet (152 meters) of human sensitive receptors (i.e., houses, schools, hospitals), prepare and implement a herbicide drift management plan to reduce the possibility of chemical drift into populated areas. The Plan shall include the elements listed below. To minimize risks to the public, mitigation measures for herbicide application methods related to timing of herbicide use, area of treatment, and public notification, shall be implemented by entities engaging in treatment activities as identified below:

- Herbicide will be applied in accordance with the manufacturer's label.
- CDFW will coordinate with the County Agricultural Commissioner to identify and avoid impacts to any nearby sensitive areas (e.g., schools, hospitals) that require notification prior to herbicide applications.

- CDFW will identify nearby sensitive habitat and, where feasible, establish buffer zones to avoid affecting sensitive receptors.
- Herbicide will be applied using the coarsest droplet size possible that maintains sufficient plant coverage while minimizing drift into adjacent areas.
- Herbicide shall not be applied when winds exceed 10 miles per hour or when inversion conditions exist (consistent with the herbicide labels); or when wind could carry spray drift into inhabited areas. Refer to Section 3.3 (Air Quality) for discussion on inversions.
- Public access to treatment sites will be restricted during treatment windows.
- No surfactants containing nonylphenol ethoxylate will be used.

Level of Significance: Less than significant with mitigation.

With implementation of Mitigation Measure HHM-1, HHM-3, and HHM-4, the risks to workers, the public and the environment would be minimized and mitigated to a less-than-significant level.

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
2. Discovery of existing unknown contaminated soil or groundwater in the Project Area

The Project Area is undeveloped and does not appear on a list of hazardous materials sites. Therefore, the potential to encounter contaminated soil or groundwater at the site is considered low and the impact would be less than significant.

Accidental spills could occur during construction as hazardous materials would be used in varying amounts during construction of the Project. Construction activities would use common materials such as cleaning products, fuels (diesel and gasoline), lubricants and oils.

Caltrans and CHP regulate the transportation of hazardous materials and wastes, including container types and packaging requirements, as well as licensing and training for truck operators, chemical handlers, and hazardous waste haulers. Cal-OSHA also enforces hazard communication program regulations, which contain worker safety training and hazard information requirements, such as procedures for identifying and labeling hazardous substances, communicating hazard information related to hazardous substances and their handling, and preparation of health and safety plans to protect workers and employees.

Construction specifications would include the following requirements in compliance with applicable regulations and codes: 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 a designated 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 Loleta Fire Protection District.

Contractors would also 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, the risk of exposure of construction workers to accidental release of hazardous materials would be reduced, as would the demand for incident emergency response. However, if not properly managed, the use of hazardous materials during construction activities could result in hazards to the public or environment. The impact is considered potentially significant.

Invasive Plant Management and Maintenance

Invasive plant management activities would include the use of herbicide. It is unlikely that maintenance of infrastructure and Project amenities would utilize herbicide or other hazardous materials, however it may potentially occur. Project activities are required to be consistent with federal, state, and local laws and regulations addressing hazardous materials management and environmental protection, as described above. However, if not properly managed, the use of herbicide and other hazardous materials under the Project could result in hazards to the public or environment. The impact is considered potentially significant.

Mitigation Measures: Implement Mitigation Measures HHM-2, HHM-5 and WQ-2.

The Project would implement Mitigation Measures HHM-2, HHM-5 and WQ-2 from the 2013 Spartina PEIR (H.T. Harvey and GHD 2013) to reduce the potential for the public or environment to be exposed to accidental releases of hazardous materials. As above, the scope of the 2013 Spartina PEIR measures has been expanded to reflect that their implementation would also apply to herbicide application to European beachgrass, and to other Project activities that would result in comparable potential impacts to health and safety (i.e., estuarine tidal restoration construction work).

Mitigation Measure HHM-2: Accidents Associated with Release of Chemicals and Motor Fuel.

Contractors and equipment operators on site during Project activities will be required to have emergency spill cleanup kits immediately accessible. If fuel storage containers are utilized exceeding a single tank capacity of 660 gallons or cumulative storage greater than 1,320 gallons, a Hazardous Materials Spill Prevention Control and Countermeasure Plan (HMSPCCP) would be required and approved by the NCRWQCB. The HMSPCCP regulations are not applicable for chemicals other than petroleum products;

therefore, the contractor shall prepare a spill prevention and response plan for the specific chemicals utilized during Project activities. This mitigation is intended to be carried out in conjunction with Mitigation WQ-2.

Mitigation Measure HHM-5: Health Effects to Workers, the Public and the Environment Due to Accidents Associated with Use of Hazardous Materials.

Appropriate health and safety procedures and equipment shall be used to minimize risks associated with use of hazardous materials under the Project, including exposure to or spills of fuels, petroleum products, and lubricants. These shall include the preparation of a health and safety plan, a spill contingency plan, and if threshold onsite storage values are exceeded, an HMSPCCP.

Mitigation Measure WQ-2: Minimize Herbicide Spill Risks.

Herbicides shall be applied by or under the direct supervision of trained, certified or licensed applicators. Herbicide mixtures shall be prepared by, or under the direct supervision of trained, certified or licensed applicators. Storage of herbicide and surfactants on or near the Project Area shall be allowed only in accordance with a Spill Prevention and Control Plan approved by the NCRWQCB; on-site mixing and filling operations shall be confined to areas appropriately bermed or otherwise protected to minimize spread or dispersion of spilled herbicide or surfactants into surface waters. This mitigation is intended to be carried out in conjunction with Mitigation Measure HMM-2.

Level of Significance: Less than significant with mitigation.

With implementation of the above-referenced mitigation measures, construction, invasive plant management and maintenance 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 due to the requirements to have spill kits, a spill prevention and response plan, a health and safety plan and a spill contingency plan, and through the use of trained, certified or licensed applicators. With the implementation of Mitigation Measures HHM-2, HHM-5, and WQ-2, the potential for the Project to create a significant hazard to the public or the environment through the accidental release of hazardous materials into the environment would be reduced to a less-than-significant level.

Impact HAZ-3: 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 primary fire hazard severity zone applied to the Project Area is LRA Unzoned, with segments of the north and central portions of the Project Area designated as LRA Moderate (CAL FIRE 2008). The Project Area is not located in or near lands classified as a very high fire hazard severity zone, however it is located adjacent to a SRA.

The Project vicinity is rural and generally characterized by open pastures, scattered barns and residences. The Project Area consists of undeveloped land, a large portion of which is tidally-influenced and/or regularly inundated by water. The Project Area does not contain any residential structures and the Project does not include development of any structures for human occupancy. Adjacent land generally consists of open agricultural pasture and farmland. The nearest residential community to the Project Area is located on Indianola Reservation Road, approximately 350 feet (107 meters) northeast of the Project Area.

Invasive plant management activities would include use of prescribed burning. Although, the use of prescribed burns to control invasive plants represents a potential risk to people or structures if not properly controlled, the Project would implement prescribed burns in coordination with CAL FIRE and follow an approved Burn Plan. With implementation of the approved plan, the potential to expose people or structures to wildland fires would be less than significant. Prescribed burns are not proposed in construction or maintenance activities.

Please refer to Section 3.17 Wildfire for a more detailed discussion of wildfire risks and hazards.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.8.6 Cumulative Impacts

Impact HAZ-C-1: Would the Project result in a cumulatively significant impact from increased exposure of the public or environment to hazards or hazardous substances?

As described in Impact HAZ-1, HAZ-2, and HAZ-3, the Project would have less-than-significant impacts with implementation of mitigation relative to the use of hazardous substances during construction activities and use of herbicide for invasive plant management. Similar to the Project, construction and maintenance of other restoration based cumulative projects identified in Table 3-1 could potentially utilize similar construction activities and herbicide for invasive plant management. Cumulative projects would be subject to compliance with applicable hazardous materials regulations, including federal, state, and local regulations. Implementation of the mitigation measures required for the Project require a variety of preventative and protective measures throughout construction and maintenance. With implementation of mitigation measures, the Project's contribution to cumulative impacts related to use or release of hazardous substances during construction would not be cumulatively considerable, and therefore less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.8.7 References

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3.9 Hydrology and Water Quality

This section evaluates the potential impacts related to hydrology and water quality during construction, invasive plant management and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. For the purpose of this section, the study area includes the Project Area, McNulty Slough and associated levee systems, the first 500 feet (152 meters) of lower Hawk and Sevenmile sloughs, and the entirety of North Bay upstream of its confluence with the Eel River. See Figure 3.9-1 – Study Area, for a visual representation of the study area.

3.9.1 Setting

The study area includes a sliver of coastline that extends for nearly four miles between the Eel River mouth at the south end and the Table Bluff uplands to the north. North Bay and McNulty Slough represent the east boundary of the study area and the Pacific Ocean forms the west boundary. Immediately east and parallel to the beach are dune fields that forms a low ridgeline. Collectively, the beach and dune fields represent a barrier beach/spit that separates the Eel River valley and delta from the ocean. Between the barrier bar and McNulty Slough is a lowland salt marsh that was diked and drained to accommodate livestock grazing during the late 1800s. Associated with that grading was the construction of a network of levees that border both sides of McNulty Slough and diminish tidal exchange into and across the salt marsh. McNulty Slough proper is a tidal slough channel that extends north from North Bay, a small embayment just north of the Eel River mouth.

Watershed Context and Hydrology Overview

The Eel River drains a watershed (basin) that comprises approximately 3,683 square miles of rugged Coast Range terrain where elevations range from sea level to 7,000 feet (2,134 meters). It is about 120 miles long, averages 30 miles in width, and is underlain chiefly by sedimentary rocks (mostly graywacke sandstone) of the Franciscan complex that have been uplifted and are fractured, faulted, and penetratively sheared (Bailey et al. 1964; Brown and Ritter 1971; McLaughlin et al. 2000). Much of the watershed has been subject to heavy logging, grazing, and widespread road construction that have destabilized soils (Brown and Ritter 1971; CDFW 2010).

The region has a Mediterranean climate with cool wet winters, and warm dry summers. The study area exhibits mild weather throughout the year characterized by cool, foggy summers and cool, rainy winters. December is the coldest month, with an average maximum temperature of 55 °F and an average minimum temperature of 41 °F. August is the warmest month which has an average maximum temperature of 64 °F and an average minimum temperature of 53 °F. Rainfall occurs

from October through April, and annual precipitation ranges from about 35 inches along the coast to more than 110 inches in the mountains southeast of Scotia (Rantz 1969). Large and intense cyclonic storms lasting several days occur periodically in northern California and have generated flood-producing rainfall (Wolman, 1990; Harden, et. al., 1995; Sloan et. al. 2001). Collectively, the geology, steep slopes, intense land use, and heavy precipitation generates much mass wasting and widespread erosion each year that contributes to the sediment yield out of the basin (Brown and Ritter, 1971; Sloan et. al. 2001). Brown and Ritter (1971) report that the annual suspended sediment yield out of the Eel River basin is more than 15 times that of the Mississippi River and more than four times that of the Colorado River.

The Eel River estuary is protected by a barrier beach/spit and could be classified as a bar-built estuary (Pritchard, 1967). Such a classification is based exclusively on geologic features and more recent estuary classification systems include a greater number of attributes such as wave and tidal energy, water circulation patterns, and habitat typing (USACE 2002; NOAA 2020a; FGDC 2012; Heady et. al. 2014). The Nature Conservancy (Heady et. al. 2014) classifies the Eel River estuary as a “riverine estuary”. Such estuaries are defined as being generally linear and seasonally turbid (especially in upper reaches), and possibly subjected to high current velocities. These estuaries are also sedimentary “sinks” and may be associated with a delta, bar, barrier island and other depositional features. They also tend to be highly flushed (with a wide and variable salinity range) and seasonally stratified. These estuaries are often characterized by a V-shaped channel configuration and a salt wedge (Heady et. al. 2014).

Salinity within the estuary was estimated during the 1970s by the California Department of Water Resources (CDWR) through measurements of electrical conductivity (CDWR 1977). Similar measurements were conducted periodically in McNulty Slough by the Wiyot Tribe between 2004 and 2015 (CDFW 2010; Wiyot Tribe 2020). The CDWR data indicates that salinity in the estuary is highly varied with regard to location, tide, and the seasonal fluctuations of Eel River streamflow. In general, salinity values are highest closest to the river mouth and diminish with distance away from the mouth upstream through the various sloughs and the mainstem Eel River. The maximum extent of estuarine influence in the mainstem appears to be Fernbridge located approximately 7 miles upstream from the river mouth, while tidal influence (water movement) may extend upstream as far as the confluence with the Van Duzen River (CDFW 2010)

CDWR (1977) reports greater salinity values during high tides compared to low tides, and higher salinity values during late summer when freshwater inputs to the estuary are at a minimum. CDWR also found that in early summer, specific conductance in parts of the estuary were stratified with high values at the bottom and low values at the surface during high tide. As discussed by CDFG (1977), this phenomenon was attributed to a saltwater “wedge” moving back and forth in the sloughs. High tides bring in dense saltwater from the ocean, and as the saltwater proceeds upstream, less dense freshwater flows over the denser saltwater. In late summer, however, the saltwater wedge was less prevalent because the freshwater flow is very slight. Given these patterned fluctuations of salinity, the Eel River estuary could be classified as “intermittent”. As defined in the literature however, estuarine intermittency implies wholesale shifts in salinity and ecotone for

prolonged periods of time (Elliot and McLusky 2002; Tagliapietra et.al. 2009; Saintilan et.al. 2016). For example, if the freshwater input dries up completely during the dry season, the estuary loses its identity and becomes an oceanic embayment. On the other hand, if a barrier bar/beach completely blocks the mouth of the river, the estuary again loses its identity and becomes a freshwater lagoon. Review of U.S. Geological Survey (USGS) gaging station data, a compilation of newspaper articles extending back to 1854 (Klamath Resource Information System 2020) and other historic literature (Monroe and Reynolds 1974; Ames 1983; PWA 1988; USDA 1989; Roberts 1992; CDFW 2010) revealed no reports of the Eel River going dry and not discharging freshwater into the estuary. As for mouth closures, only one report was found. That closure occurred in April of 1988, is stated to have been the “first ever closure” and appears to have persisted for about three weeks (PWA 1988; USDA 1989). Collectively, the discussion above suggests that the Eel River estuary is not an intermittent estuary because freshwater input prevails year-round as does an open connection to the sea. Instead, the estuary appears better classified as a salt-wedge estuary during the winter and early summer months and perhaps a slightly stratified estuary during the late summer (NOAA 2020a).

Drainage and Flooding

Brown and Ritter (1971) report that the average annual runoff in the Eel River basin is approximately 35 inches (~6.9 million acre-feet (maf)). Runoff from nearly 91 percent of the Eel River basin is measured at two long-term USGS gauging stations: Eel River near Scotia (No. 11-477000) and the Van Duzen River near Bridgeville (No. 11-478500). The highest annual runoff volume total for the Eel River measured at the Scotia gage was 12.5 maf in 1983. During the catastrophic flood of December 23, 1964, the peak flood recorded at the USGS Scotia gage is reported to have been 752,00 cubic feet per second (cfs). Approximately two hours later and 14 miles farther downstream, the flood peak reached Fernbridge and may have exceeded 800,000 cfs (CDWR 1965). An oblique aerial photograph dated December 23, 1964 shows the lower Eel River valley/delta at Port Kenyon near the City of Ferndale inundated by about four feet of water in all directions.

Contemporary flooding of the Eel River delta and the study area is fairly common (Image 3.9-1) and associated with low-recurrence flood events of the Eel River and tides. During the dry season, Eel River baseflow conditions prevail and diurnal tidal exchange dominates the hydrology of the study area.

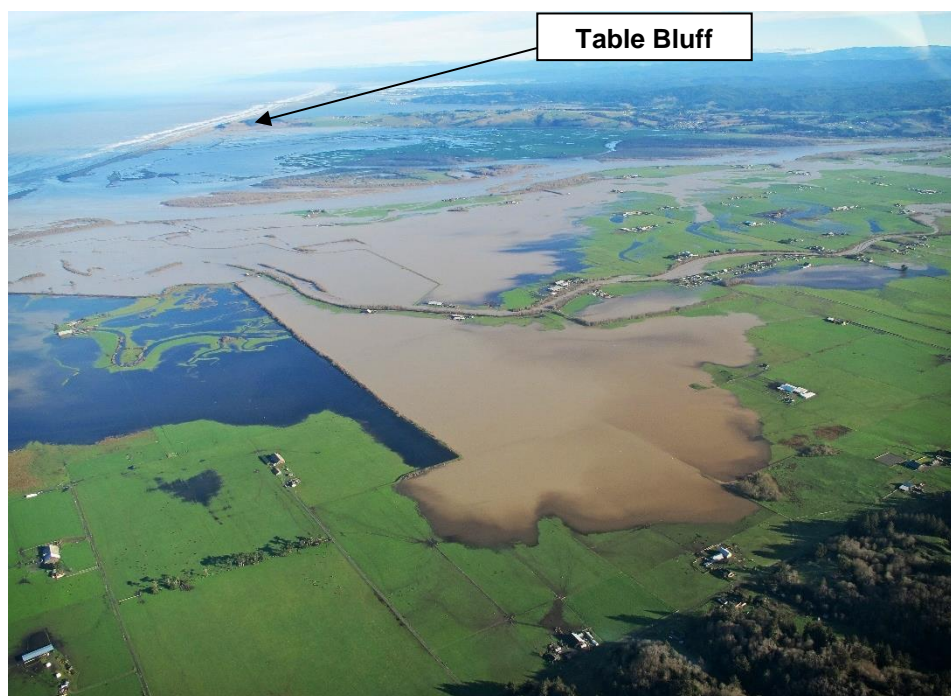


Image 3.9-1. Oblique aerial photograph taken looking north across the lower Eel River valley and delta. Foothills of the Ferndale Hills in the lower right. McNulty Slough and the Project Area are flooded in the upper left. Photograph was taken by Dr. Brad Finney (Humboldt State University) on January 18, 2016 around 10:00 AM. Flow in the Eel River measured at the USGS Gage at Scotia corresponds to a 2.7-year recurrence interval flood. Tide level is about one foot (0.3 meter) above Mean Sea Level (and about 5.5 feet [1.7 meters] below Mean Higher High Water) as recorded by the NOAA North Spit Tide Gage (#9418767).

Much of the Project Area interior is topographically low salt marsh and tidal slough channels lying less than six feet (1.8 meters) above Mean Sea Level (MSL). The Mean Higher High Water (MHHW) tide level at the Humboldt Bay North Spit tide gage (#9418767), which is located approximately 7 miles north of the Project Area, is 6.51 feet (1.98 meters) above MSL. In other words, much of the Project Area is flooded at least once-a-day during high tide cycles.

During the rainy season, low recurrence interval (~ 2.5 years) peak flow events of the Eel River flood the Study Area and much of the surrounding Eel River delta area (Image 3.9-1). Floodwater depths vary depending on the tide level. Many much larger and noteworthy floods occurred in the lower Eel River during the latter half of the 1800s and the first half of the 1900s (McGlashan and Briggs 1939). Floods in 1915 and 1937 are considered comparable and are associated with inundating homes and ranch buildings along the lower river downstream of Fortuna (McGlashan and Briggs 1939). During the latter half of the 1900s, major floods in the lower Eel River occurred in 1955, 1964, and 1974 (Hofmann and Rantz 1963; Young 1963; Wannanean et. al., 1971; CDFG 1977). Young (1963) reports that “the flood of December 1955 is known to be the greatest since 1910 and is probably the greatest since the winter floods of 1861-62.” Wannanean et. al. (1971) report that the December 1955 flood peak at the Scotia gage was comparable to that reached

by the floods of 1861-62. They also state that the December 1964 flood peak stage at the Scotia gage exceeded that of the 1955 flood by 10.1 feet (3.1 meters).

In summary, the Project Area is flooded to a certain extent each day as a function of high tides and is also flooded by frequently occurring Eel River flows with recurrence intervals in the range of 2.5 years. Notable floods that exceed those which occurred in 1915 and 1937 have occurred six times since late 1955. Two of those floods were the catastrophic events occurring in 1955 and 1964. Because of the common frequency of both tidal and Eel River flooding, the Project Area is regularly exposed to potential flood-related impacts under existing conditions. Young (1963) provides a map of the 1955 flood across the lower Eel River valley which shows the flood's water surface elevation over the Project Area to be approximately 16 feet (4.9 meters) above MSL. Official flood hazard area mapping by the Federal Emergency Management Agency (FEMA) is available of the lower Eel River valley and depicts the limits of the 100-year flood on the lower Eel River very similar to the limits of the 1955 flood mapped by Young (1963). In the vicinity of the Project Area, the FEMA map indicates that the surface elevation of the 100-year flood would be approximately 10 feet (3 meters) above MSL. As per FEMA then, the 100-year flood event would inundate most of the Project Area, including the perimeter levee system that defines the Project Area. The western portion of the Project Area is not included in the 100-year flood delineation because the dune field rises to an elevation of between 20 feet to 30 feet (6.1 meters to 9.1 meters) above MSL. Importantly, the existing access road to the Project Area from Table Bluff Road does not fall within the limits of the 100-year flood as mapped by FEMA (see Figure 3.9-2 – FEMA 100-Year Flood).

In addition to natural flood hazards, flooding can occur as a result of inundation caused by failure of a dam, seiches, or tsunamis. The study area is not located near isolated bodies of water that would be subject to inundation by seiche. The topography of the study area is generally flat and no areas that are likely to produce mudflows have been mapped or are present (Humboldt County 2019). However, the study area is located within a coastal area subject to inundation from a tsunami. The tsunami hazard is discussed in Section 3.6, Geology and Soils.

Local Groundwater Basin and Beneficial Uses

The study area lies within the Eel River Valley Groundwater Basin (ERVGB) which is the largest groundwater basin in Humboldt County. This basin comprises 114 square miles and includes the lower Eel River valley from the ocean upstream to the town of Scotia as well as the lower 14 miles of the Van Duzen River valley (CDWR 2016; CDWR 2020). Groundwater from the basin represents 96 percent of the freshwater supply in the basin and serves the residential, municipal, and agriculture needs of approximately 23,400 residents and also provides baseflow to streams and surface water bodies. The principal aquifers within the basin are in good hydrologic connection with the ocean along approximately ten miles of coastline. There have been no documented instances of inelastic subsidence of the basin or persistent declines of groundwater levels, and groundwater levels have been stable for the last ten years. Excessive chloride concentrations have been detected in wells up to four miles inland of the Pacific Ocean and are attributed to the percolation of brackish water from tidally influenced reaches of the river and nearby slough channels

(CDWR 2020). The ERVGB is designated as Basin 1-010 and has been identified 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 the groundwater resources of the basin in a sustainable manner. Primary objectives of the GSA management plan are to avoid undesirable impacts from groundwater development.

Geologic investigations of the Eel River groundwater basin were conducted by USGS in the early 1950s and then again in 1975 (Evenson 1959; Johnson 1978). Unconsolidated alluvial deposits as much as 200 feet (61 meters) thick and composed of poorly sorted sand and gravel underlie the lower Eel River valley and provide the largest volume of groundwater (Johnson 1978). Aquifers in the lower Eel River valley are recharged by rainfall, overbank flooding, and percolation as groundwater flows down the Eel and Van Duzen valleys towards the coast under a hydraulic gradient of about 5 feet (1.5 meters) per mile (Evenson 1952). Moreover, groundwater from the alluvial aquifer is discharged naturally by seepage into the tidal estuary of the Eel River. The rate of this natural seepage is probably influenced by the rise and fall of the tide; that is, at high tide natural ground-water discharge is at a minimum, and at low tide natural discharge is at a maximum. Evenson (1959) documents that groundwater levels (i.e., the groundwater table) within the lower Eel River valley generally lie within 20 feet (6.1 meters) of the ground surface. Johnson (1978) reports that groundwater levels in the lower valley fluctuate seasonally approximately four feet (1.2 meters), with lower levels occurring during the dry season. Johnson (1978) describes the alluvial aquifer north of the Eel River (i.e., between the Eel River and Table Bluffs uplands) as naturally degraded by seawater. He also maps the landward edge of the freshwater-seawater transition zone as about 3 miles east of the ocean shoreline.

In recent years, approximately 11,900 acres of private agricultural land in the lower Eel River valley has been irrigated annually by groundwater (Humboldt County 2018). Pumping and use of groundwater does not occur within the Project Area. Surface water use within the Project Area is limited to natural resources-related beneficial uses only and is not consumed or utilized for other purposes.

Beneficial Uses of Project Area Surface Waters

The Water Quality Control Plan for the North Coast Region (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 2018, Table 2-1). The beneficial uses serve as a basis for determining appropriate water quality objectives for the region. The Project is located within the Lower Eel River, Ferndale Hydrologic Subarea (111.11), and the Basin Plan identifies several beneficial uses for the area, summarized in Table 3.9-1.

Table 3.9-1. Beneficial Uses of Surface Waters in the Ferndale Hydrologic Subarea

Type of Beneficial Use	E/P?	Type of Beneficial Use	E/P?
Municipal and Domestic Supply	E	Inland Saline Water Habitat	
Agricultural Supply	E	Wildlife Habitat	E
Industrial Service Supply	E	Rare, Threatened, or Endangered Species	E
Industrial Process Supply	P	Marine Habitat	P
Groundwater Recharge	E	Migration of Aquatic Organisms	E
Freshwater Replenishment	E	Spawning, Reproduction, and/or Early Development	E
Navigation	E	Shellfish Harvesting	E
Hydropower Generation	P	Estuarine Habitat	E
Water Contact Recreation	E	Aquaculture	P
Noncontact Water Recreation	E	Native American Culture	E
Commercial and Sport Fishing	E	Flood Peak Attenuation/Flood Water Storage	
Warm Freshwater Habitat		Wetland Habitat	
Cold Freshwater Habitat	E	Water Quality Enhancement	
Preservation of Areas of Special Biological Significance		Subsistence Fishing	

Source: NCRWQCB 2018 (adapted from Table 2-1)

Note: An “E” or “P” designates an “existing” or “potential” beneficial use respectively.

Surface Water Quality

Several surface waters in the study area do not meet state water quality standards. The Lower Eel River Hydrologic Area, (including the Eel River Delta), is listed as impaired for sediment and water temperature; McNulty Slough is listed as impaired for dissolved oxygen; and the mainstem Eel River with the study area is listed as impaired for aluminum (EPA 2007). Listing a waterbody as impaired for a particular constituent requires development of 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 U.S. Environmental Protection Agency (EPA) on December 18, 2007. The TMDL includes numeric

targets, source analysis, and sediment loading rates within the watershed (EPA 2007). TMDLs for dissolved oxygen and aluminium for the affected water bodies identified above is scheduled for completion in 2021 and 2025 respectively.

Turbidity and Salinity

Between 1973 and 1976, the CDWR measured turbidity repeatedly at eleven different sites in the lower estuary area (CDWR 1977). Those measurements found turbidity to be highly variable between stations and with time at individual stations. In general, turbidity levels were highest during the winter and spring periods of high runoff, and lowest in summer and fall. Additionally, turbidity was typically higher during low tides than during high tides. Ducks Unlimited, Inc. (DU 2015) measured turbidity and salinity in North Bay (within the study area) from January 2014 to July 2014 and again from November 2014 to January 2015. Specific to a flow event in early March 2014, they report low concentrations (5-10 milligrams per liter [mg/L]) of suspended sediment, similar to that of ocean water, when Eel River discharge was low (i.e., less than 5,000 cfs), tides dominated the estuary, and salinity values were relatively high (20-30 parts per thousand [ppt]). In contrast, suspended sediment concentrations increased to between 600 to 800 mg/L in response to higher Eel River discharge (i.e., rising limb of the hydrograph) that coincided with high tide. Turbidity concentrations decreased precipitously during the ebb tide period and remained low during the falling limb of the river hydrograph even as the flood tide returned. This example appears to indicate that high turbidity values in the estuary are primarily correlated to higher Eel River discharges. This is consistent with the findings of CDWR regarding higher turbidity during the winter and spring periods of higher river flows.

As discussed above, CDWR (1977) measured electrical conductivity at multiple sites and multiple times between 1973 and 1976 to estimate salinity values throughout the estuary (CDWR (1977)). In general, CDWR reports greater salinity values during high tides compared to low tides, and higher salinity values during late summer when freshwater inputs to the estuary are at a minimum. CDFG (1977) interprets the CDWR data to indicate that in early summer, parts of the estuary are stratified with high salinity values at the bottom and low values at the surface during high tide. Ducks Unlimited's measurements of electrical conductivity in North Bay indicate relatively high levels of salinity when the estuary is dominated by tidal action and Eel River flows are minimal. Conversely, salinity values can drop to nearly zero during Eel River freshets (Ducks Unlimited, Inc. 2015).

Site Hydrology and Management Areas

All elevations used to describe the Project Area are provided in North American Vertical Datum of 1988 (NAVD88). The Project Area is predominately flat and less than seven feet (2 meters) in elevation (see Figure 3.9-3 – Existing Topographic Elevations, for elevations of the estuarine portion of the Project Area). Extreme elevations in the Project vicinity range from a low of 10 feet (3 meters) below MSL at the invert of the existing breach to Area A to more than 150 feet (46 meters) above MSL along the crest of Table Bluff, just north of the study area. In between those extremes, dunes of the barrier beach to the west generally exceed 20 feet (6.1 meters) in elevation and locally rise to as much as 30 feet (9.1 meters) in elevation above MSL. The perimeter levee surrounding the Project Area stands at

approximately 12 feet (3.6 meters) in elevation, and the borrow-ditch adjacent to the levee is typically about six feet (1.8 meters) deep with an invert elevation close to MSL. Prominent levees within the interior are also about 12 feet (3.7 meters) in elevation, and those along the east side of McNulty Slough are closer to 10 feet (3 meters) in elevation. Other constructed features within the Project Area include a roadway that extends from Table Bluff Road down through the center of Area A, and several linear drainage ditches that were excavated to create pasture for livestock grazing. Many of the remnant tidal slough channels remain within the Project Area although they have largely silted in. See Figure 3.9.4 – Existing Channel Network for an exhibit showing the existing channel network.

The Project Area is comprised of five management areas: Area A through Area E (Figure 2.2 – Project Area); the elevations of Area B are the lowest in the Project Area, averaging 1 to 2 feet (0.3 to 0.6 meters) below the elevation of the others (Ducks Unlimited, Inc. 2015). Details of each management area are provided below; a description of the dunes is provided in Section 3.6 (Geology & Soils).

Area A – 306 acres

Area A is the largest area and is connected to McNulty Slough through a levee breach along its eastern boundary. Because of the breach, Area A receives the greatest tidal prism volume of all the management areas. Three prominent interior channels drain Area A, two appear to be naturally-formed channels which are visible on the 1888 map of the Project vicinity (see Figure 3.9.5 – 1888 Map of the Eel River Estuary). The third channel is a ditch that lies inside and immediately adjacent to the perimeter levee. This channel is interpreted to be the borrow area (i.e., borrow-ditch) from which material was excavated to originally construct the levee as well as improve it as necessary over time. A freshwater seep has been impounded within Area A at its southwest corner just inside the perimeter levee (Ducks Unlimited, Inc. 2015). Most of Area A has mud substrates (silt loam and silty clay loam), but there are elevated areas within the interior with naturally occurring sand substrates, the same as found in the sand dunes on the west side of the study area. The largest of these sand dune “islands” are found in the southern interior region and several smaller ones occur in the north part of the area (Pacific Coast Fish, Wildlife and Wetlands Restoration Association (Pacific Coast Restoration) 2018). Area A is primarily tidal wetlands (saltmarsh with interspersed mudflats at low tide) with an extensive monoculture stand of dense flowered cordgrass. Brackish marsh is present in the northern reaches of Area A near Area E.

Area B – 111 acres

Area B has the lowest elevations and the most extensive intertidal mudflats of all the management areas. It contains both remnant naturally-formed tidal channels and anthropogenic linear ditches. While managed in the past as seasonal freshwater wetlands controlled by a 48-inch diameter tide-gate, the control flap has been lost and now an open connection exists between Area B and McNulty Slough. Tidal water enters the unit during high tides and Area B now functions as a muted tidal basin with daily fluctuations in water levels within a range of one foot or less. In general, water elevations are shallow throughout the unit with depths around one to two feet at high tide with deeper depths within the historic channels (Ducks Unlimited, Inc. 2015). Because of the tidal influence, over 60 percent of the area is

unvegetated mudflat. However, brackish and salt marsh vegetation occupies higher-ground edge habitat surrounding the mudflats and small islands within the mudflat area are vegetated with dense-flowered cordgrass (Pacific Coast Restoration 2018).

Area C – 40 acres

Area C is bound to the north by the Table Bluff uplands out of which at least two springs/seeps contribute freshwater to the northern portion of the area. Area C elevations are on average lower than those in Area A and comparable to those in Area B. Area C also includes remnant tidal channels and is managed as freshwater wetlands with a leaky 36-inch weir box water connecting it to Area B. As of 2015, the structure was allowing a small amount of water exchange between the two areas. Like Area A, a borrow ditch parallels the inside of the perimeter levee for most of its length (Ducks Unlimited, Inc. 2015). Area C has the most extensive development of freshwater shrub wetlands and the most diverse fresh to slightly brackish marsh of all the management areas (Pacific Coast Restoration 2018).

Area D – 5 acres

Area D is the smallest management area and is separated from Area C by an internal levee. It receives muted tidal flow from McNulty Slough through two open 12-inch culverts in the perimeter levee that fills intertidal channels and interior ditches (Pacific Coast Restoration 2018), as well as from high flow and tide events at the upstream end of McNulty Slough at the road/boat ramp. The tide range within Area D is highly muted due to the constriction caused by the culverts (Ducks Unlimited, Inc. 2015). Most of the area is salt marsh and is vegetated by pickleweed mats. Along the upper margins of the salt marsh are transitional fresh to slightly brackish marsh ecotones.

Area E – 11 acres

Area E is a managed freshwater wetland and is separated from Area A by a levee with a leaky 24-inch flashboard weir that provides muted tidal flow from Area A into Area E (Ducks Unlimited, Inc. 2015). The tidal flow extends north to a shallow brackish pond bordered by salt marsh. The pond retains water at low tide but exhibits fluctuations in water level with the tidal cycle (Pacific Coast Restoration 2018). A large spring on Table Bluff delivers freshwater to this unit, and much of this wetland is densely vegetated with willows and other woody vegetation that make it difficult to access (Ducks Unlimited Inc. 2015).

Summary of Project-Specific Hydraulic Modelling

Considerable hydraulic analysis was conducted to develop an optimal restoration design for the Project Area (AECOM 2019). The hydraulic analysis involved a Project-specific two-dimension computational hydraulic model that allowed for a number of different features (e.g., different breach and channel sizes) to be compared and contrasted in terms of changes in tidal prism, flow efficiency, and water surface elevations. One aspect of the modeling effort was to detect zones of increased flow velocity. Besides the baseline model of existing conditions, 17 different model simulations were conducted. Of these simulations, Case 8a in the model represents the proposed Project, and informs the Project-specific impact analysis detailed under Impact HWQ-3.

Climate Change and Sea Level Rise

Warming atmospheric and ocean temperatures are leading to rising sea levels. Relative sea level trend for the nearby North Spit tide gage (#9418767) shows a rise in sea level of 8.3 inches (+/- 0.03 inches) over the 42 years between 1977 and 2019. This equates to an average rise of 0.2-inches per year (in/yr) which is equivalent to a change of 1.65 feet (0.5 meter) in 100 years (NOAA 2020b). The State of California Sea Level Rise Guidance document (California Ocean Protection Council 2018) projects that sea level at the North Spit (nearest modeled location to the Project Area) will most likely increase between 0.32 in/yr and 0.63 in/yr between 2060 and 2080 in response to a “high emissions” scenario. Under a “low emissions” scenario, sea level rise at the North Spit is projected to increase by a rate of between 0.2 in/yr and 0.39 in/yr (OPC 2018). Given those projected rates and a 50 year planning horizon, sea level at the North Spit is most likely to rise at least 0.84-feet and could rise as much as 2.62 feet (0.79 meter) by 2070.

AECOM (2019) conducted a sea level rise analysis in conjunction with hydraulic modeling for Project development. Their analysis assumed an increase in sea level elevation of 1.5 feet (0.46 meters), which is within the range of the OPC 50-year sea level rise estimate. The most notable difference between modeling sea level rise for existing conditions versus that of the proposed Project is local floodplain inundation (by levee overtopping) east of McNulty Slough and along Hawk Slough (AECOM 2019, Figure 53 and Figure 55).

3.9.2 Regulatory Framework

Federal

Clean Water Act

The 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. It established the basic structure for regulating discharges of pollutants into Waters of the United States. It also gave the 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 EPA and U.S. Army Corps of Engineers (USACE). At the state and regional levels in California, the CWA is administered in part and enforced by the State Water Resources Control Board (SWRCB) and the nine RWQCBs.

Section 303(d) of CWA requires state governments to present the 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. In accordance with CWA 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 NCRWQCB has continued to identify the Lower Eel River as impaired in subsequent listing cycles, the latest being 2014-2016. The primary purpose of the TMDLs for the Lower Eel River is to ensure that beneficial uses of freshwater habitat (such as salmonid habitat) are protected from elevated sediment and temperature levels. 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 CWA Section 401 Water Quality Certification from the RWQCB and a CWA Section 404 permit from USACE.

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. An NPDES permit is required when proposing to or discharging waste into any surface water of the state. The SWRCB 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 (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.

Federal Antidegradation Policy

The federal antidegradation policy is set forth in 40 Code of Federal Regulations (CFR) Section 131.12. It 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. 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, including consideration of existing instream uses and water quality.

State

Porter Cologne Water Quality Control Act

The Porter Cologne Water Quality Control Act (Porter-Cologne) is the primary statute covering the quality of waters in California. Under Porter-Cologne, the SWRCB allocates water rights, adjudicates water right disputes, develops state-wide water protection plans, establishes water quality standards, and guides nine

RWQCBs state-wide. The joint authority of water allocation and water quality protection enables the SWRCB to provide comprehensive protection for California's waters. RWQCB boundaries are based on watersheds and water quality requirements are based on the unique differences in climate, topography, geology, and hydrology for each watershed. The RWQCBs regulate water quality under Porter-Cologne through the standards and objectives set forth in Water Quality Control Plans (also referred to as Basin Plans) prepared for each region. The current 2018 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.

Beneficial uses of surface waters and groundwater within the study area is identified in Table 3.9-1 (Beneficial Uses of Surface Waters in the Ferndale Hydrologic Subarea). The beneficial uses serve as a basis for determining appropriate water quality objectives for the region. To protect these beneficial uses, the Basin Plan sets forth water-resource protection objectives for inland surface waters spanning many parameters. Basin Plan parameters relevant to potential water quality impacts of Project actions include: floating material, suspended material, settleable material, oil and grease, sediment, turbidity, pH, dissolved oxygen, temperature, toxicity, waste discharge and effluent limits, pesticides, and chemical constituents.

Wetland Riparian Area Protection Policy

The SWRCB adopted a State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures), for inclusion in the forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California. The Procedures took effect May 28, 2020 and consist of four major elements: 1) a wetland definition; 2) a framework for determining if a feature that meets the wetland definition is a Water of the State; 3) wetland delineation procedures; and 4) procedures for the submittal, review and approval of applications for Water Quality Certifications and Waste Discharge Requirements for dredge or fill activities. The Procedures, formerly known as the *Wetland Riparian Area Protection Policy*, has been renamed in order to communicate that the Procedures apply to all discharges of dredged or fill material to waters of the state, not just wetlands.

California Coastal Act

The California Coastal Act (Coastal Act) of 1976 requires any person proposing to develop in the coastal zone to obtain a Coastal Development Permit or obtain coverage under a Consistency Determination. 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 (CAL FIRE).

Section 30233 of the Coastal Act recognizes restoration as an allowable use and reason for placing fill material in. 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. Proposed projects must also incorporate the “best mitigation measures feasible.”

Fish and Game Code Section 1602

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 that would substantially alter the bed, bank, or channel of a lake or stream, would substantially divert or obstruct the flow of water, or that would use material from the streambed. A Lake or Streambed Alteration Agreement (LSAA) includes avoidance and minimization measures necessary to protect those resources, and CDFW would review an LSAA for the Project prior to implementing stream alteration work.

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Potential impacts within each resource category extending beyond the Project Area boundary, such as potential impacts to waterways or levees within the study area but outside of the Project Area, are analyzed utilizing local regulatory documents such as the Humboldt County General Plan and the Local Coastal Program Eel River Area Plan. Therefore, local and regional regulatory policies are included in this analysis.

Humboldt County General Plan

The following policies from the Humboldt County General Plan (2017) are applicable to the Project with regard to hydrology and water quality:

WR-P1. Sustainable Management

Ensure that land use decisions conserve, enhance, and manage water resources on a sustainable basis to assure sufficient clean water for beneficial uses and future generations.

WR-P2. Protection for Surface and Groundwater Uses

Impacts on Basin Plan beneficial water uses shall be considered and mitigated during discretionary review of land use permits that are not served by municipal water supplies.

WR-P9. Mitigate Controllable Sediment Discharge Sites

Proposed development applications involving a site identified as part of the TMDL Controllable Sediment Discharge Inventory shall be conditioned to reduce sediment discharge.

WR-P10. Erosion and Sediment Discharge

Ministerial and discretionary projects requiring a grading permit shall comply with performance standards adopted by ordinance and/or conditioned to minimize erosion and discharge of sediments into surface runoff, drainage systems, and water bodies consistent with BMPs, adopted TMDLs, and non-point source regulatory standards.

WR-P12. Project Design

Development should be designed to complement and not detract from the function of rivers, streams, ponds, wetlands, and their setback areas.

WR-P21. Enhance Groundwater Recharge Capacity

Encourage watershed management practices that enhance infiltration of rainfall into the groundwater.

WR-P35 Implementation of NPDES Permit

Implement and comply with the NPDES permit issued by the SWRCB to the designated portions of the County.

WR-P36. Natural Stormwater Drainage Courses

Natural drainage courses, including ephemeral streams, shall be retained and protected from development impacts which would alter the natural drainage courses, increase erosion or sedimentation, or have a significant adverse effect on flow rates or water quality. Natural vegetation within riparian and wetland protection zones shall be maintained to preserve natural drainage characteristics consistent with the Biological Resource policies. Stormwater discharges from outfalls, culverts, gutters, and other drainage control facilities that discharge into natural drainage courses shall be dissipated so that they make no significant contribution to additional erosion and, where feasible, are filtered and cleaned of pollutants

WR-P37. Downstream Stormwater Peak Flows

Peak downstream stormwater discharge shall not exceed the capacity limits of off-site drainage systems or cause downstream erosion, flooding, habitat destruction, or impacts to wetlands and riparian areas. New development shall demonstrate that post development peak flow discharges will mimic natural flows to watercourses and avoid impacts to Beneficial Uses of Water.

WR-P39. Restoration Projects

The County shall encourage restoration projects aimed at reducing erosion and improving habitat values in Streamside Management Areas and wetlands.

WR-P42. Erosion and Sediment Control Measures

Incorporate appropriate erosion and sediment control measures into development design and improvements.

WR-P44. Storm Drainage Impact Reduction

Develop and require the use of Low Impact Development (LID) standards consistent with RWQCB requirements to reduce the quantity and increase the quality of stormwater runoff from new development and redevelopment projects in areas within the County's MS4 boundary or as triggered under other RWQCB permits. For all other watersheds, develop storm drainage development guidelines with incentives to encourage LID standards to reduce the quantity and increase the quality of stormwater runoff from new developments

WR-P45. Reduce Toxic Runoff

Minimize chemical pollutants in stormwater runoff such as pesticides, fertilizers, household hazardous wastes, and road oil by supporting education programs, household hazardous waste and used oil collection, street and parking lot cleaning and maintenance, use of bioswales and other stormwater BMPs described in the California Stormwater Best Management Practices Handbooks or their equivalent.

WR-P46. Fish Passage Designs.

Work with federal and state agencies and local watershed restoration groups to retrofit existing drainage and flood control structures and design new structures to facilitate fish and other wildlife passage in partnership with federal and state agencies.

S-P15. Construction within Special Flood Hazard Areas

Construction within a floodplain identified as the 100-Year Flood Boundary on FEMA's Flood Insurance Rate Map shall comply with the County's Flood Damage Prevention Regulations. Fill in the floodplain shall only be allowed if it can be demonstrated that the fill will not have cumulative adverse impacts on or off site and such fill shall not be detrimental to productive farm land, and is otherwise in conformance with the County's Flood Damage Prevention Regulations.

AG-P11. Support Vegetative Management Programs

Support vegetation management programs (controlled burning, etc.) when it is found that they improve the availability and quality of rangeland for livestock and wildlife, reduce the hazard of disastrous wildfires, and increase water quality and quantity.

IS-P13. Drainage and Flood Control

Develop and maintain a countywide drainage and flood control plan to guide capital improvements and maintenance and serve as a basis for long-term sustainable funding mechanisms.

BR-P4. Development within Stream Channels

Development within stream channels shall be permitted when there is no lesser environmentally damaging feasible alternative, and where the best feasible mitigation measures have been provided to minimize adverse environmental effects. Development shall be limited to essential, non-disruptive projects as listed in Standard BR-S6 - Development within Stream Channels.

Eel River Area Local Coastal Plan

Sections of the Eel River Area Plan that pertain to protection of hydrology and water quality include:

2553 Policies. Section 5: All development should be designed to minimize erosion and sedimentation.

4235 Drainage. Section 2: Natural drainage ways shall be utilized where possible to convey drainage flows consistent with streamside management policies in the General Plan.

4235 Drainage. Section 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)

3.9.3 Evaluation Criteria and Significance Thresholds

The Project would cause a significant impact related to hydrology and water quality, as defined by the CEQA Guidelines, if it would:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
 - Result in substantial erosion or siltation on- or off-site;
 - 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; or
 - Impede or redirect flood flows.
- In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation; or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

3.9.4 Methodology

Potential impacts to hydrology and surface water quality are evaluated for construction, invasive plant management and maintenance activities. The Project is 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. 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: Would the Project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

The following provides a discussion of the impacts of the Project on surface water quality. Refer to Impact HWQ-2 for a discussion of potential construction-related impacts on groundwater.

Construction

The greatest potential Project impacts to water quality could result from sediment mobilization during tidal channel/wetland construction. Construction activities, such as levee breaching, levee lowering, construction of habitat ridges, habitat fill, levee removal, installation of ditch blocks, installation of large wood, site clearing, grading, excavation, channel widening/deepening, dredging, and material stockpiling 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. Where possible, work areas would be dewatered and isolated; however, in some locations, including Area A, dewatering would not occur. If construction 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 and would be reduced to a level that is less than significant with the implementation of Mitigation Measures HWQ-1, HWQ-2, and WQ-6.

Invasive Plant Management

A primary objective of the Project is to manage invasive plant species in both the estuarine restoration and tidal restoration areas. As described below, invasive plant management activities may have potential effects on water quality due to the release of sediment and/or herbicide into waterways.

Dense-flowered Cordgrass

The Project proposes management of up to 571 acres (231 hectares) of dense-flowered cordgrass using mowing, grinding, excavation, prescribed burning, and/or herbicide application methods, some of which may increase local turbidity or introduce herbicide or petroleum-based chemicals to surface waters (see analysis

in Invasive Plant Removal Methods below). Potential impacts and mitigation measures for the removal of dense-flowered cordgrass using all of these methods, with the exception of prescribed burning, were evaluated in the Final Programmatic Environment Impact Report for the Humboldt Bay Regional Spartina Eradication Plan (H.T. Harvey & Associates and GHD 2013), hereafter referred to as the 2013 Spartina PEIR. Given the Project Area falls within the management area of that regional dense-flowered cordgrass eradication effort, erosion control-related impacts of invasive plant removal are incorporated by reference and summarized below.

Impact WQ-6: Erosion/Sediment Control at Staging and Access Areas.

Temporary ground disturbance associated with site ingress/egress, staging, stockpiling, and equipment storage areas could occur in areas outside and adjoining treatment areas. These temporary disturbed areas have the potential to impact water quality from erosion and sediment mobilization. Rain and wind-induced erosion from these temporarily disturbed areas could carry soil contaminants (e.g., nutrients or other pollutants) into waterways adjacent to treatment areas and degrade water quality standards for specific chemicals, dissolved oxygen, suspended sediment, or nutrients. Impacts would be less than significant with mitigation. (From 2013 Spartina PEIR, H.T. Harvey & Associates and GHD 2013, page 128.)

Impact WQ-7: Decreased Dissolved Oxygen in Receiving Waters

Treatment techniques (e.g., grinding) that increase and leave in place above ground biomass (wrack) could potentially result in decreased dissolved oxygen in receiving waters during the decay period, depending on where and how the wrack is deposited. Tidal currents and wind-induced waves could transport the wrack and debris into adjacent waters with low dissolved oxygen. In areas of poor tidal circulation, wrack and debris may accumulate, and further impede tidal exchange, further degrading dissolved oxygen. This impact would be less than significant with mitigation. (From 2013 Spartina PEIR, H.T. Harvey & Associates and GHD 2013).

Potential impacts on water quality from the removal of dense-flowered cordgrass would be potentially significant.

European Beachgrass

European beachgrass would be removed from the Primary Treatment Area (207 acres [84 hectares]) over a six-year period in two phases. Treatment methods could include manual, mechanical, prescribed burning and/or herbicide application methods. It is assumed that ongoing invasive plant management activities would occur for up to ten years or as long as needed to achieve control and/or eradication. European beachgrass removal would occur in the dune restoration area, which is predominantly sand and hydrologically disconnected from surface waters, except at the southern end where it borders North Bay and at the northern end near a small tidal channel in Area E. The hydrologic isolation of the dune restoration area would limit potential impacts to water quality resulting from various treatment strategies; however, there would still be some potential for delivery of sediment, nutrients, or chemicals to receiving waters during removal of European beachgrass which could result in a potentially significant impact on water quality.

Dwarf Eelgrass

The Project proposes to remove dwarf eelgrass from McNulty Slough, as needed, using manual removal and smothering methods. Due to its limited extent and proposed removal methods that would utilize non-intensive handwork, potential impacts to water quality resulting from the removal of dwarf eelgrass would be less than significant (see Invasive Plant Removal Methods below).

Invasive Plant Removal Methods

Manual Removal and Smothering

As noted above, dwarf eelgrass would be treated by manual removal and smothering, both of which would utilize hand tools. A small amount of local turbidity may occur for a short duration during manual removal and smothering. Any local turbidity would quickly dissipate with tidal flushing, remaining consistent with background turbidity levels commonly experienced at the site during high tide and flood events. The impact related to manual removal and smothering would be less than significant.

European beachgrass could also be treated with hand removal as a secondary method. As noted above, given the location of European beachgrass on the dunes (and its general hydrologic isolation from surface waters), water quality impacts from hand removal of European beachgrass are not anticipated.

Excavation

European beachgrass may be removed with heavy equipment (excavation) as a secondary treatment method. The use of this equipment, including ingress and egress of the equipment to treatment areas, may result in potentially significant impacts if sediment (sand) is mobilized into surface waters. These impacts would be reduced to less than significant levels with implementation of Mitigation Measures HWQ-1, HWQ-2, and WQ-6.

Herbicide Application

Application of the herbicide Imazapyr would also be used to treat dense-flowered cordgrass and European beachgrass. Use of Imazapyr in the dunes would limit potential impacts to surface waters because the dune restoration areas is generally hydrologically disconnected from surface waters. Furthermore, as described in Section 3.8.5, Imazapyr is safe for aquatic environments, where it dissipates from surface water within days, and would not adversely impact water quality during plant removal in the estuarine restoration area. Therefore, the impact related to herbicide application would be less than significant.

Flaming

Flaming would be used to control the regrowth of dense-flowered cordgrass over time. Given that flaming would utilize a handheld propane torch to deliver a small controlled flame to a targeted plant, potential impacts on water quality would be minimal and less than significant.

Prescribed Burning

The Project also anticipates using prescribed burning as a method for management of dense-flowered cordgrass and European beachgrass. Prescribed burning as a treatment method for dense-flowered cordgrass was not evaluated in the 2013 Spartina PEIR (H.T. Harvey & Associates and GHD 2013). This method would be used under the Project to address the large-scale stands of dense-flowered cordgrass within the Project Area, as well as the significant amount of large wood onsite which may make removal by mowing or excavation difficult. Prescribed burns may be used as initial treatment and later followed by manual removal to target remaining rhizomes.

European beachgrass would also be treated with prescribed burning in ten 1,312 foot (400 meter) long plots in two phases (i.e., five plots treated in Year 1; five plots treated in Year 3). Prescribed burning of European beachgrass would target aboveground removal of biomass prior to manual removal or herbicide application.

All prescribed burning would be conducted in accordance with an approved burn plan coordinated with CAL FIRE. Prescribed burning may result in localized impacts to water quality, including a potential small increase in phosphorous and other nutrient parameters. Following burning, nutrient levels of phosphates and/or nitrates are not anticipated to detectably increase. Erosion of burned surfaces after precipitation events may also result in short-term increases in turbidity into adjacent tidal waterways and saltmarshes, although these short-term small spikes in turbidity are not expected to exceed background turbidity levels due to the frequent high tides and flooding common in the Project Area.

In summary, short-term increases in turbidity, phosphates, or nitrates from prescribed burning of dense-flowered cordgrass would be less than significant level due to the tidal regime of the Project Area. Similarly, water quality impacts from prescribed burning of European beachgrass would be less than significant because treatments would occur in an area largely isolated from surface waters, and would be phased temporally over a number of years and spatially across a large area. .

Maintenance

Potential impacts to water quality are not expected to occur from maintenance or monitoring activities. All maintenance activities occurring in or near water would limit erosion and disturbance as much as possible and would employ BMPs to protect water quality where appropriate. Maintenance would occur infrequently and on an as needed basis; monitoring would occur as needed by CDFW and in accordance with Project permits. Due to the limited maintenance anticipated at the site, potential impacts to water quality from maintenance activities are considered less than significant.

Public Access

Potential water quality impacts associated with public access could include an increase in littering or disturbance to water quality (e.g., turbidity). Public access could also increase the potential off-trail use, which could result in wetland compaction and sediment delivery to surface waters. Because public access is currently supported in the Project Area and the level of public use is not expected to

significantly increase, potential impacts associated with public access under the Project, including boating, are considered less than significant.

Mitigation Measures: Implement Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-6, HHM-2, HHM-4, and WQ-2.

The Project would implement the following mitigation measures, some of which (Mitigation Measures WQ-2, WQ-6, HHM-2, and HHM-4) are defined in the 2013 Spartina PEIR (H.T. Harvey and GHD 2013) to reduce potential impacts on water quality from management of dense-flowered cordgrass. These 2013 Spartina PEIR measures have been slightly adapted to reflect that their implementation would also apply to treatment of European beachgrass, and to other Project activities that would result in comparable potential impacts to water quality (e.g., use of equipment to implement the tidal restoration component of the project). Implementation of the mitigation measures below would reduce the potential impacts of Project construction and invasive plant management activities on water quality, including potential increases in turbidity or pollutants and/or decreases in dissolved oxygen levels, and would ensure the Project does not violate any water quality standards, waste discharge requirements, or otherwise substantially degrade surface or groundwater quality.

Mitigation Measure HWQ-1: Implement Best Management Practices to Protect Water Quality

The following representative BMPs will be implemented to protect water quality during construction:

- Contractors will be responsible for minimizing erosion and preventing the transport of sediment to sensitive habitats/wetlands. Accordingly, 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.
- The following BMPs from the current California Stormwater Quality Associations' California Stormwater BMP Handbook for Construction will be implemented by the Contractor:
 - EC-1: Scheduling
 - EC-2: Preservation of Existing Vegetation
 - NS-2: Dewatering Operations
 - NS-9: Vehicle Equipment and Fuelling
 - NS-10: Vehicle and Equipment Maintenance
 - WM-2: Material Use; and
 - WM-4: Spill Prevention and Control

- Sufficient erosion control supplies will be maintained on site at all times, available for prompt use in areas susceptible to erosion during rain events;
- Disturbance of existing vegetation will be minimized to only that necessary to complete the work;
- The contractor will make adequate preparations, including training and providing equipment, to contain oil and/or other hazardous materials spills;
- Dewatering operations will be conducted where needed, with water disposed of appropriately (e.g., allowed to settle in an isolated area, or discharged to an upland location where it won't discharge back to surface waters);
- Vehicle and equipment maintenance should be performed off-site whenever practical;
- The contractor shall ensure that the site is prepared with BMPs prior to the onset of any storm predicted to receive 0.5 in (1.27 cm) or more of rain over 24 hours; and
- All erosion and sediment control measures shall be maintained until disturbed areas are stabilized.

Mitigation Measure HWQ-2: Erosion and Water Quality Control Measures During Channel Excavation and Ground Disturbance

Erosion and turbidity control measures shall be implemented in areas where excavation or ground disturbance would occur and could deliver sediment to an adjacent surface water (e.g., construction of Project tidal channels, installation of ditch blocks and large wood, levee lowering and removal, and installation of public access components). Depending on site conditions, these measures could include installation and maintenance of in-stream turbidity curtains, cofferdams and/or silt-fence along channel banks, as specified in Project designs, specifications and erosion control plans. Whenever feasible, construction will be scheduled to coincide with low tides to avoid increases in turbidity or potential impacts to aquatic habitats. Where possible, channel excavation or dredging will be isolated and hydrologically disconnected from surface waters.

Mitigation Measure WQ-6: Designate Ingress/Egress Routes

Temporary ground disturbance associated with site ingress/egress, staging, stockpiling, and equipment storage areas could occur in areas outside and adjoining work areas. Where areas adjacent to staging and stockpile areas are erosion prone, the extent of staging and stockpile shall be minimized by flagging their boundaries. An erosion/sediment control plan shall be developed for erosion prone areas outside the work area where greater than 0.25 acre (0.1 hectare) of ground disturbance may occur as a result of ingress/egress, access roads, staging and stockpile areas. The erosion/sediment control plan shall be developed by a qualified professional

and identify BMPs for controlling soil erosion and discharge for treatment-related contaminants. The erosion/sediment control plan shall be prepared prior to any ground disturbing activities and implemented during construction (H.T. Harvey & Associates and GHD 2013, page 128).

Mitigation Measures HWQ-3: Removal of Wrack

Tidal flushing is anticipated to alleviate wracking throughout the Project Area. During site specific planning, tidal circulation will be visually assessed. In areas with relatively low tidal circulation, it will either be assumed that dissolved oxygen levels are depressed or monitoring will be conducted to determine if dissolved oxygen levels are depressed. In treatment areas located within or adjacent to waters known or expected to have depressed dissolved oxygen, if wrack greater than ¼ acre is generated during Project implementation, the wrack shall be removed from the treatment areas subject to tidal inundation or mulched finely and left in place.

Mitigation Measure HHM-2: Accidents Associated with Release of Chemicals and Motor Fuel.

Contractors and equipment operators on site during Project activities will be required to have emergency spill cleanup kits immediately accessible. If fuel storage containers are utilized exceeding a single tank capacity of 660 gallons or cumulative storage greater than 1,320 gallons, a Hazardous Materials Spill Prevention Control and Countermeasure Plan (HMSPPCP) would be required and approved by the NCRWQCB. The HMSPPCP regulations are not applicable for chemicals other than petroleum products; therefore, the contractor shall prepare a spill prevention and response plan for the specific chemicals utilized during Project activities. This mitigation is intended to be carried out in conjunction with Mitigation WQ-2.

Mitigation Measure HHM-4: Avoid Health Effects to the Public and Environment from Herbicide.

For areas targeted for application of herbicide that are within 500 feet (152 meters) of human sensitive receptors (i.e., houses, schools, hospitals), the contractor shall prepare and implement an herbicide drift management plan to reduce the possibility of chemical drift into populated areas. The Plan shall include the elements listed below. To minimize risks to the public, mitigation measures for herbicide application methods related to timing of herbicide use, area of treatment, and public notification, shall be implemented by entities engaging in treatment activities as identified below:

- Herbicide will be applied in accordance with the manufacturer's label.
- CDFW will coordinate with the County Agricultural Commissioner to identify and avoid impacts to any nearby sensitive areas (e.g., schools, hospitals) that require notification prior to herbicide applications.
- CDFW will identify nearby sensitive habitat and, where feasible, establish buffer zones to avoid affecting sensitive receptors.

- Herbicide will be applied using the coarsest droplet size possible that maintains sufficient plant coverage while minimizing drift into adjacent areas.
- Herbicide shall not be applied when winds exceed 10 miles per hour or when inversion conditions exist (consistent with the herbicide labels); or when wind could carry spray drift into inhabited areas. Refer to Section 3.3 (Air Quality), for discussion on inversions.
- Public access to treatment sites will be restricted during treatment windows.
- No surfactants containing nonylphenol ethoxylate will be used.

Mitigation Measure WQ-2: Minimize Herbicide Spill Risks.

Herbicides shall be applied by or under the direct supervision of trained, certified or licensed applicators. Herbicide mixtures shall be prepared by, or under the direct supervision of trained, certified or licensed applicators. Storage of herbicide and surfactants on or near the Project Area shall be allowed only in accordance with a Spill Prevention and Control Plan approved by the NCRWQCB; on-site mixing and filling operations shall be confined to areas appropriately bermed or otherwise protected to minimize spread or dispersion of spilled herbicide or surfactants into surface waters. This mitigation is intended to be carried out in conjunction with Mitigation Measure HMM-2.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-2, WQ-6, HMM-2, and HMM-4, would ensure that construction, invasive plant management, and maintenance activities under the Project do not violate any water quality standards or waste discharge requirements, and would reduce potential impacts on water quality to a less-than-significant level.

Impact HWQ-2: Would the Project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Long-term groundwater pumping or use is not a proposed Project activity so the Project will not substantially decrease groundwater supplies. Project construction may involve local short-term dewatering but is not anticipated to be long lasting or detrimental to the surrounding environment. The Project includes the enhancement and restoration of estuarine habitat conditions (i.e., excavation of tidal slough channels that are connected to the shallow groundwater table). Groundwater in the lower Eel River valley is recharged from rainfall, overbank flooding, and percolation as groundwater flows down the Eel and Van Duzen River valleys towards the ocean under a hydraulic gradient of about 5 feet (1.5 meters) per mile. Consequently, the proposed channel enhancements and excavations would not alter or interfere with the mechanics of groundwater recharge within the study area. Given the hydraulic gradient, groundwater seeps naturally from the alluvial aquifer into the tidal slough channels and the rate of such seepage is influenced by the tide levels. Higher tides

limit seepage and lower tides facilitate seepage. Hydrodynamic modelling indicates that the Project would lower the MHHW tide levels by 0.2 feet (6 cm) within main slough channels (i.e., Eel River, North Bay, McNulty, and Hawk). MLLW would be raised by about the same amount (AECOM 2019). These adjustments are in the range of 5 percent of existing conditions. Given the very short period of time in which such conditions would prevail twice daily, it is unlikely that such minimal changes in tide level would result in substantial changes to groundwater seepage rates.

The Project is located at the down-gradient end of the alluvial aquifer where groundwater discharges into tidal slough channels. There are no known groundwater wells in the study area, and groundwater in the study area, as well as approximately three miles upgradient, is considered degraded by seawater. In other words, the Project Area is located far down gradient from the freshwater portion of the aquifer that supports the agricultural communities of the Eel River valley. Consequently, the Project would not adversely impact upgradient groundwater wells nor would it affect management of those wells and the larger groundwater aquifer that makes up the Eel River valley.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-3: **Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces in a manner which would result in substantial erosion or siltation on- or off-site?**

Channel dynamism is a desired condition in an estuary environment. Extreme tide and frequent low return period flood events occur with regularity in the Eel River estuary/delta under existing conditions. Infrequent and catastrophic flood events occur as well. These events erode and rearrange the deltaic sediments and adjust tidal channels within the study area. Thus, under current conditions, the study area regularly experiences erosion from hydraulic flood dynamics far more severe than would result from Project implementation or post-Project hydrology.

Project actions would alter the existing levee-controlled drainage pattern of the Project Area by reconnecting portions of the natural tidal channel network and increasing the tidal prism into the Project Area. The hydraulic model results indicate that this restorative work would reduce flow velocities in certain parts of the Project Area and increase flow velocities in others. Reductions in flow velocity have the potential to promote sediment deposition (e.g., siltation), while increases in velocity have the potential to generate bed scour and bank erosion. Such potentials exist both on- and off-site.

On-Site Erosion Potential

All material excavated from the Project Area would remain on-site and be incorporated into Project designs for beneficial reuse. Sediment reuse, as detailed in Section 2.4.8 – Beneficial Reuse of Excavated Sediments, includes the reuse of excavated sediments for other Project purposes, with the dual benefit of avoiding the need for off-site disposal and associated impacts. Sediment reuse includes

creation of high marsh habitat, filling of internal ditches, creation of habitat ridges, and installation of ditch plugs. Excessive soil may be spread as a thin layer (less than six inches (15 cm)) deep in lower elevation saltmarsh. All sediment reuse areas would be located within the FEMA flood zone and therefore subject to potential localized remobilization during flood events. Given the low elevation profile and anticipated recolonization of saltmarsh vegetation in the sediment reuse areas within one to three years, the potential Project impacts related to sedimentation are not anticipated to be significant. Any beneficial reuse of 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. Sediment mobilization and redeposition within the Project Area and study area are natural and ongoing geomorphic process of the Eel River delta.

As per the hydraulic analysis, internal channel dimensions are designed to be in equilibrium with Project hydraulic conditions to achieve hydraulic efficiencies and simultaneously minimize lateral erosion, bed scour, and bank failure. The hydraulic model results indicate that the proposed Project design would increase flow velocities in upper McNulty Slough (see Figure 3.9-6 - Speed in McNulty Slough During Peak Flood Tide for Existing Conditions and Case 8a (Project), Figure 3.9-7 – Speed in Upper McNulty Slough During Peak Flood Tide for Existing Conditions and Case 8a (Project), Figure 3.9-8 – Speed in McNulty Slough During Peak Ebb Tide for Existing Conditions and Case 8a (Project), Figure 3.9-9 – Speed in Upper McNulty Slough During Peak Ebb Tide for Existing Conditions and Case 8a (Project), Figure 3.0-10 – Comparison of Flood Tide Current Speeds at Section 750 Feet Upstream of Existing Breach, Figure 3.9-11 – Comparison of Ebb Tide Current Speeds at Section 750 Feet Upstream of Existing Breach). Such an increase in velocity is assumed to increase the potential for bed scour and bank erosion in that channel segment. Water velocities in Lower McNulty Slough generally decrease above existing conditions, and are largely unchanged in Hawk Slough during peak flood tides. Apart from the outside of channel bends discussed above, the reintroduction of tidal exchange to the excavated Project channels would not impart sufficient energy to accelerate erosion in any portion of the newly designed or improved channels. Hydraulic modeling results indicate that breaches tend to increase the tidal prism in Upper McNulty Slough and decrease the tidal prism in Lower McNulty Slough (AECOM 2019). The modelling results do not indicate that speeds through the Area A breach of McNulty Slough would increase or result in an expansion of channel capacity. The potential impact related to on-site siltation or erosion would be less than significant.

Off-Site Erosion Potential

While the hydraulic modelling did not indicate potentially substantial downstream erosion effects resulting from the Project, velocity and shear stress results suggest erosion may occur. Erosion of the eastern levee of McNulty Slough, including the toe of the eastern levee, is considered a potentially significant impact detrimental to privately owned agricultural lands and would require mitigation. Erosion of the levee would also result in a short-duration increase in turbidity. Off-site erosion downstream of the Project Area (e.g., Hawk Slough, North Bay, and the Eel River proper) is not expected to occur.

In addressing the potential of erosion along the eastern levee of McNulty Slough, several alternatives to mitigate that impact were considered: (1) armor the eastern levee of McNulty Slough; (2) construct a setback levee on the eastern bank; (3) enlarge the McNulty Slough channel; and (4) modify the Project design. The legal feasibility of the first two measures—armoring or setting back the levee—is uncertain. The levee is on private property and CDFW has no right of access to the property. Thus, the feasibility of those alternatives is questionable considering they would require CDFW to implement a Project action on property it does not own, does not have legal responsibility for, and cannot foreseeably purchase or acquire.

Hydraulic modelling was used to explore how dredging upper McNulty Slough could reduce velocities and the potential for erosion along the eastern levee. The model results (Case 11c) showed that peak flood tide velocity would still increase above existing conditions by approximately 0.2 feet/second between Station 75 and Station 100. Thus, based on hydraulic modelling results, dredging upper McNulty Slough would not effectively reduce velocities and the potential for erosion along the eastern levee. Additionally, dredging of McNulty Slough would result in potentially significant environmental impacts to sensitive species and habitats, not limited to Tidewater Goby, salmonids, eelgrass, and increases in turbidity. Significant off-hauling of dredged materials would likely be required, which would increase greenhouse gas and air quality emissions. The cost of implementing this type of mitigation—including equipment, labor, materials testing for potential contamination, and possible mitigation for environmental impacts—would significantly add to the cost of the Project. Dredging McNulty Slough may also be a temporary solution to long-term levee erosion risk because sediments may redeposit into dredged areas, causing future increases in velocity and bed shear stress. Given channel dredging in upper McNulty Slough would not mitigate the erosion potential and would be undesirable for other reasons, including construction infeasibility and/or cost infeasibility, this alternative was not further considered an effective or viable mitigation measure.

Since bank armoring and levee setback may be legally infeasible and dredging of McNulty Slough may not mitigate the erosion potential, the potential impact of erosion along the eastern levee of McNulty Slough on private property would be significant, unavoidable, and unmitigatable. The effectiveness of modifying the Project design to avoid potential hydraulic impacts (i.e., erosion potential) in McNulty Slough is described in Chapter 4, Alternatives.

Mitigation Measures: Not feasible.

Level of Significance: Significant unavoidable.

Impact HWQ-4: **Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?**

The Project Area, except for the dune restoration area, is predominantly low in elevation and subject to flooding, and Eel River flood flows dominate the hydrogeomorphic processes within the Project Area and study area (AECOM 2019). Both on-site and off-site post-Project flooding would remain a function of Eel River discharges into the estuary.

The Project proposes substantial changes to site drainage patterns and the way flood waters are routed through the Project Area. However, the Project does not include any elements that would change the flood magnitudes of source waters or rates of run-off entering or originating on the site. The most notable changes in inundation and drainage patterns that are anticipated to occur under the Project include an expansion of the tidal channel network, improved channel connectivity, and an increase in the tidal prism into and throughout the Project Area. Changes to surface topography within the Project Area include a slight increase in elevation of the saltmarsh plain in Area B, construction of habitat ridges, and installation of ditch blocks. The most significant changes to surface topography include levee breaching, channel excavation, and local levee lowering. These grading activities are designed to restore a properly functioning tidal prism that ebbs and flows efficiently within the Project Area.

The access road and parking areas would result in new impervious surfaces in the Project Area (see Section 2.6.1). However, these features would not be extensive in size and would drain to surrounding undeveloped, pervious surfaces without resulting in an increase in run-off or flood risk. New development of the 0.75 mile of non-motorized trails and non-motorized boat put-in would be pervious and would not alter run-off patterns. Increases in saltmarsh extent and function would also help to attenuate flood flows and potential related run-off impacts due to increased size and capacity.

As described in Impact HWQ-3, changes in hydraulics under the Project could impact the private levee on the east side of McNulty Slough. If that levee were to breach, it is possible tidal flooding could occur on private agricultural fields during tides higher than the top of the existing levee. Such flooding might occur independent of or coincident with an Eel River flood event. However, without mitigation, the potential impact would be significant.

Mitigation Measures: Not feasible.

Level of Significance: Significant unavoidable.

As described above under Impact HWQ-3, protection measures to mitigate potential erosion of the McNulty Slough east levee (i.e., bank armoring, levee setback and/or dredging) are not feasible. As a result, the potential impact of tidal flooding onto privately owned agricultural lands east of the Project Area remains both significant and unmitigatable. The effectiveness of reconfiguring the Project design to avoid hydraulic impacts in McNulty Slough is described in Chapter 4, Alternatives.

Impact HWQ-5: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would 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?

Project actions would alter the drainage pattern of the Project Area by expanding the tidal channel network, increasing connectivity between tidal channels and an expanded saltmarsh plain, and increasing tidal function to enhance estuarine function. Project actions would add minimal impervious surfaces in limited areas within the overall Project Area. Enhancement actions may result in short-term construction-related impacts to stormwater drainage and/or polluted runoff, which are potentially significant. However, post-construction, water quality within the Project Area would improve, stormwater drainage would benefit, and additional sources of polluted runoff would not occur.

Construction-Related Impacts

Implementation of the Project would alter the types, quantities, and timing of stormwater contaminants relative to existing conditions. If stormwater runoff generated during Project implementation 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 turbidity, settleable material, and other pollutants into local drainage channels from the Project Area. Construction, invasive plant management and maintenance-related chemicals (e.g., fuels, paints, adhesives, herbicide, 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.

Stormwater within the Project Area is not controlled by constructed infrastructure (e.g., sewer lines, drainage ditches). Rather, the stormwater capacity of the Project Area relies solely upon a network of tidal channels and wetland plains in the lower Eel River estuary that are tidally connected to the Pacific Ocean. Tidal waters circulate in and out of the Project Area twice daily during high tides. Mitigation Measures HWQ-1, HWQ-2, HWQ-3, and WQ-6 would be implemented to avoid stormwater discharges, and the stormwater capacity of the Project Area would not be exceeded. The impact would be less than significant with the implementation of mitigation measures.

Post-Construction Impacts

Currently, water quality in the Project Area is impacted by poor water circulation within the existing drainage network and limited tidal exchange. This has led to stagnant ponding, likely resulting in reduced dissolved oxygen concentrations and diminished water quality. Project elements would increase interconnected channel

network and tidal exchange, which would improve water circulation and quality and thereby yield more desirable aquatic habitat conditions.

The Project would not significantly increase the amount of existing developed areas or the amount of impervious area, as Project features have predominantly been designed to be pervious. 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., petroleum by-products, herbicide), road surface pollutants, and rainfall intensity.

Mitigation Measures: Implement Mitigation Measures HWQ-1, HWQ-3, and WQ-6.

Level of Significance: Less than significant with mitigation.

Implementation of Mitigation Measures HWQ-1, HWQ-3, and WQ-6 would ensure that the Project would not violate any surface water quality standards, and that impacts associated with invasive plant management would be reduced to a less than significant level.

Impact HWQ-6: Would the Project impede or redirect flood flows?

The Project would not include any element that would impede flood flows, such as construction of a levee or other hydraulically confining structure. The Project includes removal, lowering, and breaching of levees, which in combination with channel excavation, would alter the hydraulic setting of the Project Area but not significantly redirect flood flows. As discussed below under Impact HWQ-7, high flow conditions from the mainstem Eel River and greater Eel River estuary dominate the study area during low-return interval flood events. Flood flows entering the Project Area from the Eel River would continue to inundate the vast majority of the tidal channels and adjacent saltmarsh surfaces, with the exception of the dune restoration area, similar to existing conditions. While levee removal, breaching, lowering, and channel excavations may alter the routing of flood flows within and across the Project Area, these flood flows would not be newly redirected off-site or in a manner that alters the hydrology pattern and drainage network of McNulty Slough, Hawk Slough, tidal tributaries, or the Eel River estuary. The potential impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-7: Would the Project cause an increase in flood hazard, tsunami, or seiche zones, risk release of pollutants due to Project inundation?

The Project is not located in a seiche zone. While the Project is in flood and tsunami zones, there would be very limited pollutants in the Project Area that could be released during a natural disaster. If an extreme hazard event were to occur during construction, heavy equipment and associated diesel and fluids could be washed into the Eel River estuary and/or Pacific Ocean. Application of herbicide to remove invasive plants would not occur during a predicted flood event, when rain would limit efficacy of treatment, or during windy conditions (see Mitigation Measure HHM-4),

which can be associated with high rain and flood hazard events. The period of herbicide application would be short in duration, with herbicide only present in the Project Area when in use and would not coincide with an extreme weather event.

Post-construction, it is possible that an extreme hazard event could dislodge and wash away the proposed foot bridge, non-motorized boat put-in, or interpretive signage related to public access. During such an event, the background debris load in the lower Eel River would be substantial, and the potential input of a small foot bridge or related public access infrastructure from the Project Area would be negligible in comparison. Therefore, the potential impact of a release of pollutants or debris during a significant flood or tsunami would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact HWQ-8: Would the Project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

Water Quality Control Plan

A primary goal of the Project is to restore natural estuarine function of the Project Area, which would improve water quality to assist in the recovery and function of habitat for native species. As discussed above, the relevant water quality control plan is the NCRWQCB Basin Plan, which establishes thresholds for key water resource protection objectives for both surface waters and groundwater.

The Project shall also obtain a NCRWCB CWA Section 401 Water Quality Certification. These regulatory requirements and associated requisite monitoring will ensure a conflict with the Basin Plan does not occur.

Project actions would also not conflict with the State's groundwater planning in the Eel River Valley Basin under the Sustainable Groundwater Management Act, which primarily monitors groundwater use via pumping for agriculture and other consumptive purposes. Project actions would not consume or diminish groundwater in the Eel River Valley or Project Area.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.9.6 Cumulative Impacts

Impact HWQ-C1: Would the Project contribute to a cumulatively significant impact 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, invasive plant management, and maintenance activities. The cumulative 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 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 would be an increase in tidal prism exchanged through the lower Eel River estuary via recent enhancement actions on the south side of the mainstem Eel River, including the Salt River Ecosystem Restoration Project, pending Eel River Estuary and Centerville Slough Enhancement Project, and Smith Creek Wetland Restoration Projects. Planned restoration on Cannibal Island, which is also located in the Eel River estuary, would further restore tidal prism exchange and saltmarsh extent. These projects would, in combination with the Project, increase the volume of tidal storage and exchange through the mutually shared receiving waters of the Eel River estuary.

Designs for the Project increase 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 an increased project tidal prism would not increase the rate of sediment delivery to the Eel River estuary above natural conditions. Any associated channel expansion would occur well within the footprint of historic channel migration and former saltmarsh.

However, as discussed under Impact HWQ-3, hydraulic modelling indicates there is a potential for erosion along the eastern levee of McNulty Slough as a result of increased water velocity and bed shear stress under the Project. These hydraulic changes could ultimately contribute to localized levee failure and result in a significant impact to the private agriculture lands east of the Project Area, which could flood, erode and/or experience saltwater intrusion. This potential individual impact is significant and unmitigatable, as discussed under Impact HWQ-3. However, this individual unmitigatable impact is not cumulatively significant because it is known to exist in a precise location on the eastern side of the levee along a discrete reach of McNulty Slough and would not be potentially impacted by any other project considered in Table 3.0-1. Therefore, a less than significant cumulative impact would result.

Implementation of the Project plus the cumulative projects would not otherwise result in significant cumulative impacts on hydrology and water quality. The long-term effects of the Project would be ecologically beneficial by expansively restoring hydrologic function to the Project Area, managing invasive plant species, enhancing saltmarsh and dune habitat quality, and improving water quality. Considering the Project's landscape-scale improvement in ecological functions, cumulative impacts would be less than significant with the implementation of Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-2, WQ-6, HHM-2 and HHM-4, resulting in an environmental benefit.

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant.

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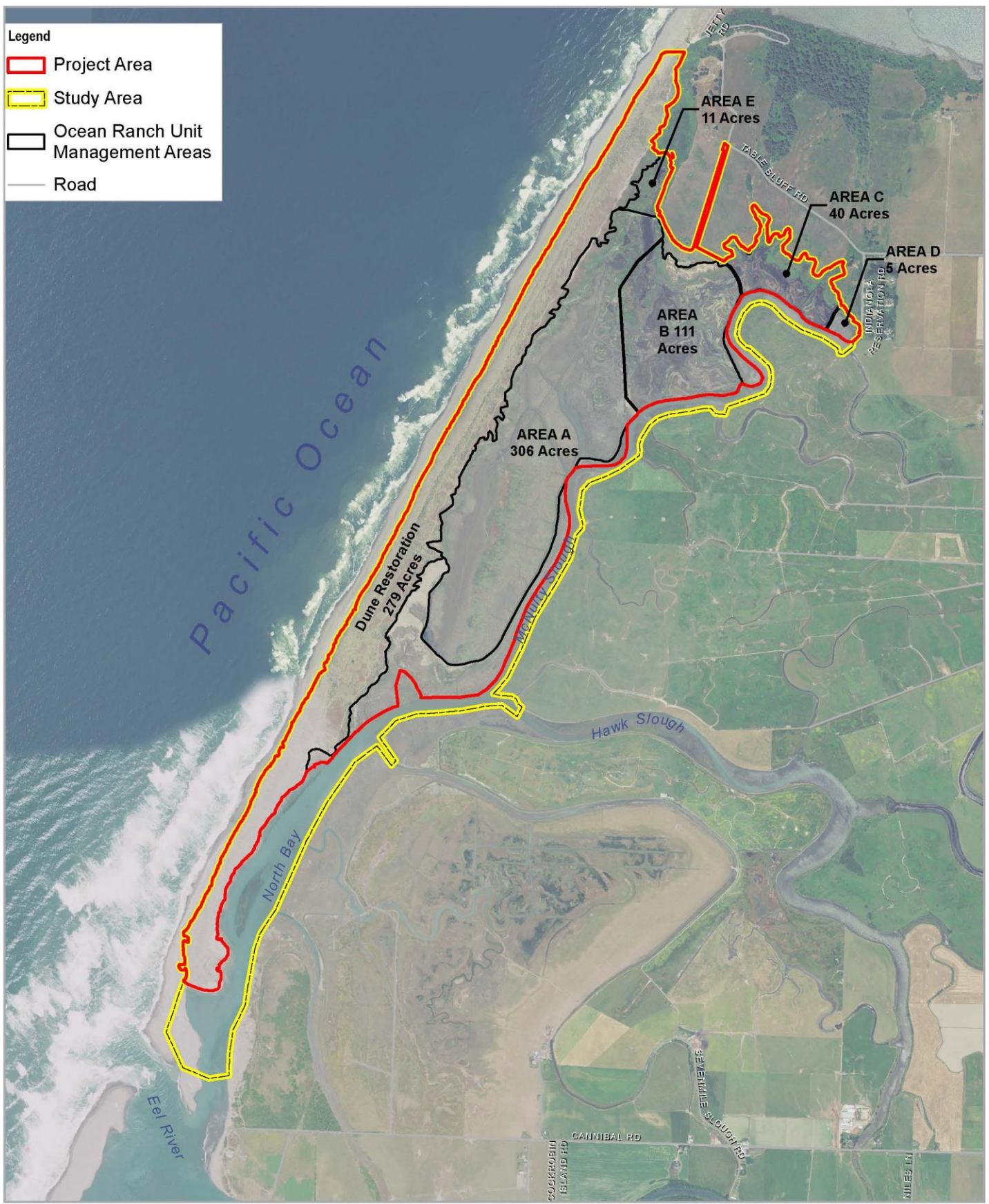
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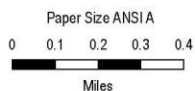
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Legend

- Project Area
- Study Area
- Ocean Ranch Unit Management Areas
- Road



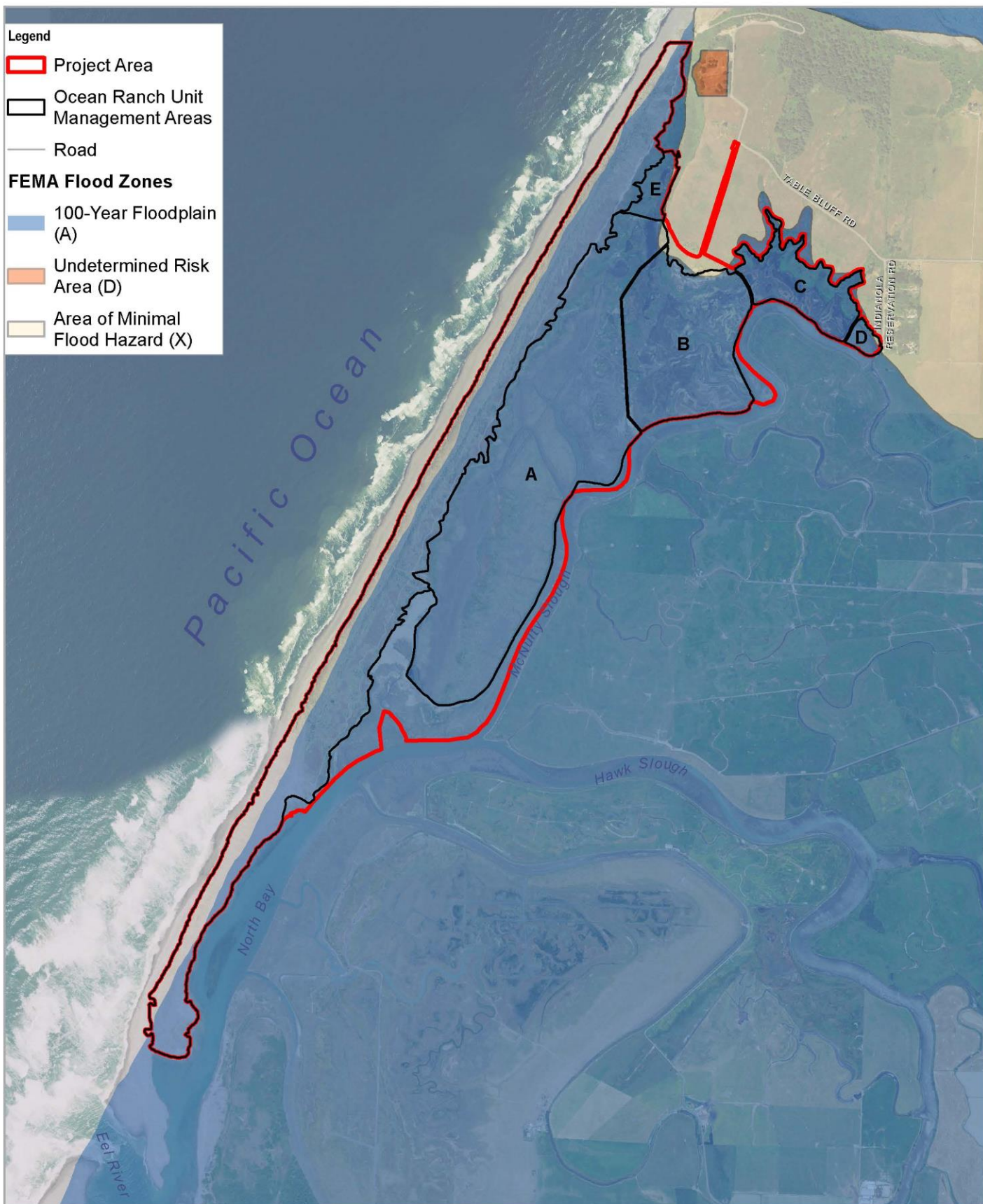
California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/22/2020

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

Hydrology and Water Quality Study Area

FIGURE 3.9-1



Paper Size ANSI A
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 Miles
 Map Projection: Lambert Conformal Conic
 Horizontal Datum: North American 1983
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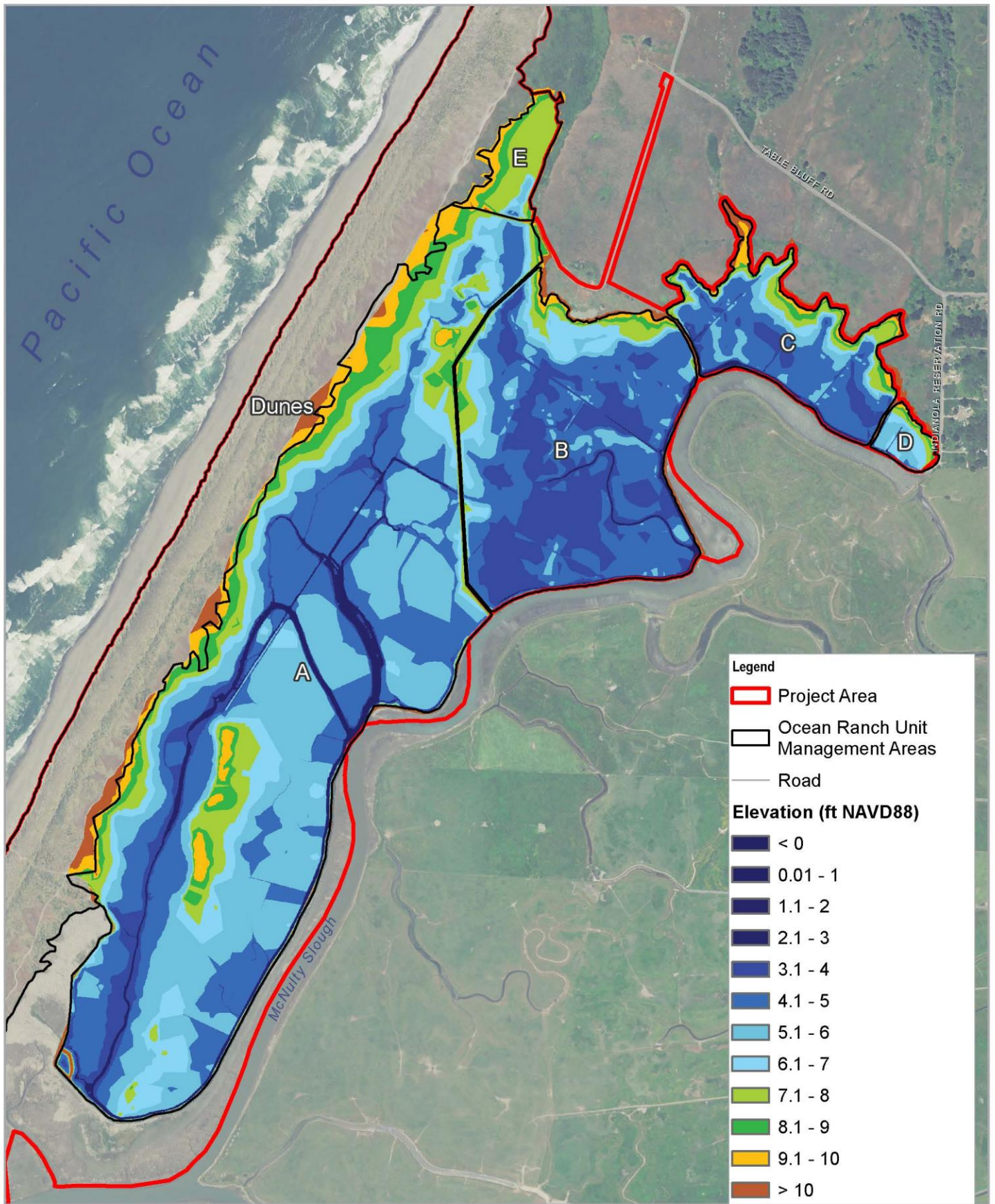


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Project No. 11152100
 Revision No. -
 Date 6/22/2020

FEMA 100-Year Flood Zone

FIGURE 3.9-2



Paper Size ANSI A
0 325 650 975 1,300
Feet

Map Projection: Lambert Conformal Conic
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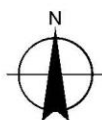
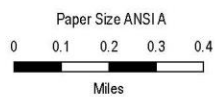
Project No. 11152100
Revision No. -
Date 6/22/2020

Existing Topographic Elevations

FIGURE 3.9-3

Legend

- Project Area
- ▲ Existing Breach
- Channel
- Road



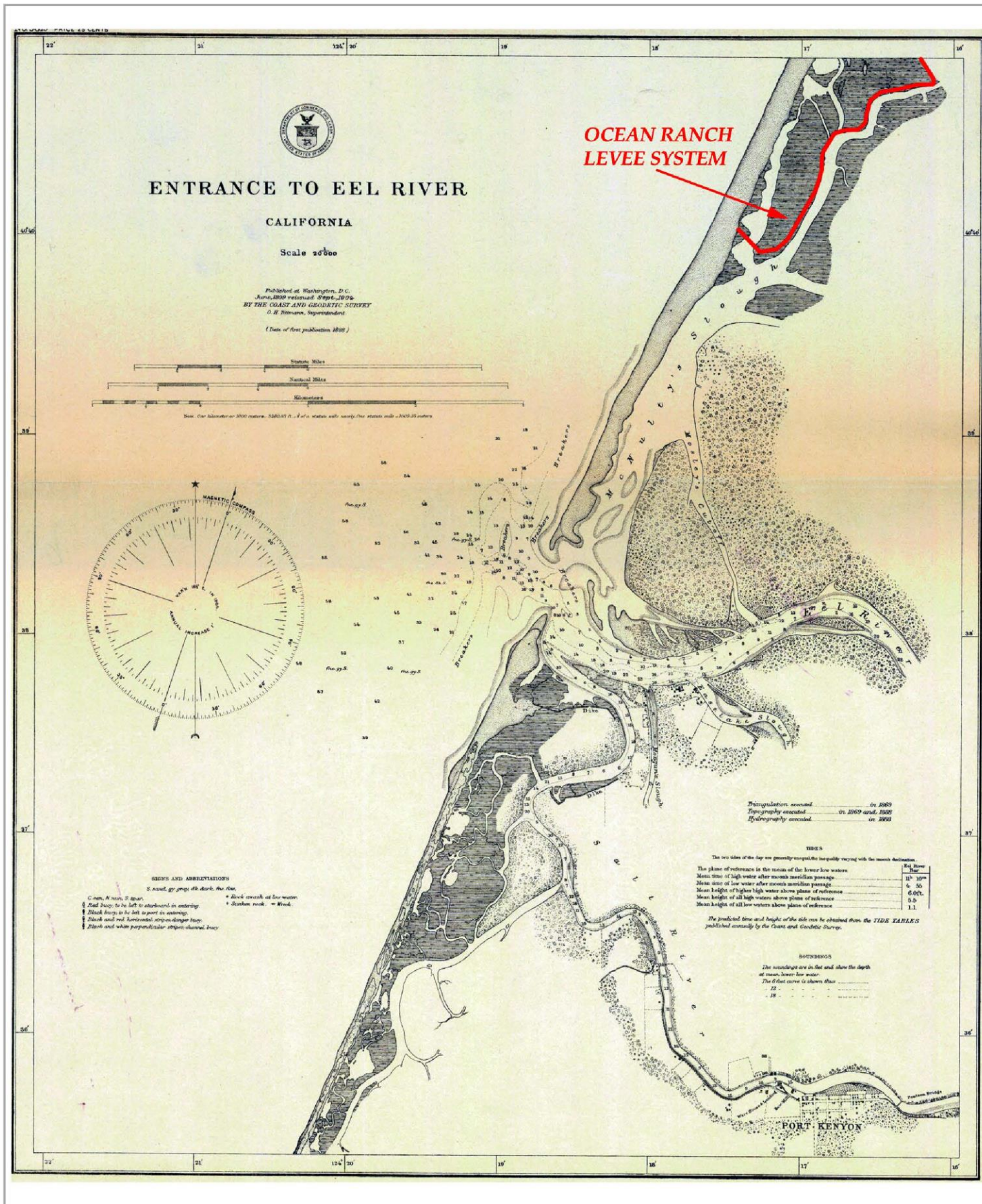
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Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 9/3/2020

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Existing Channel Network

FIGURE 3.9-4

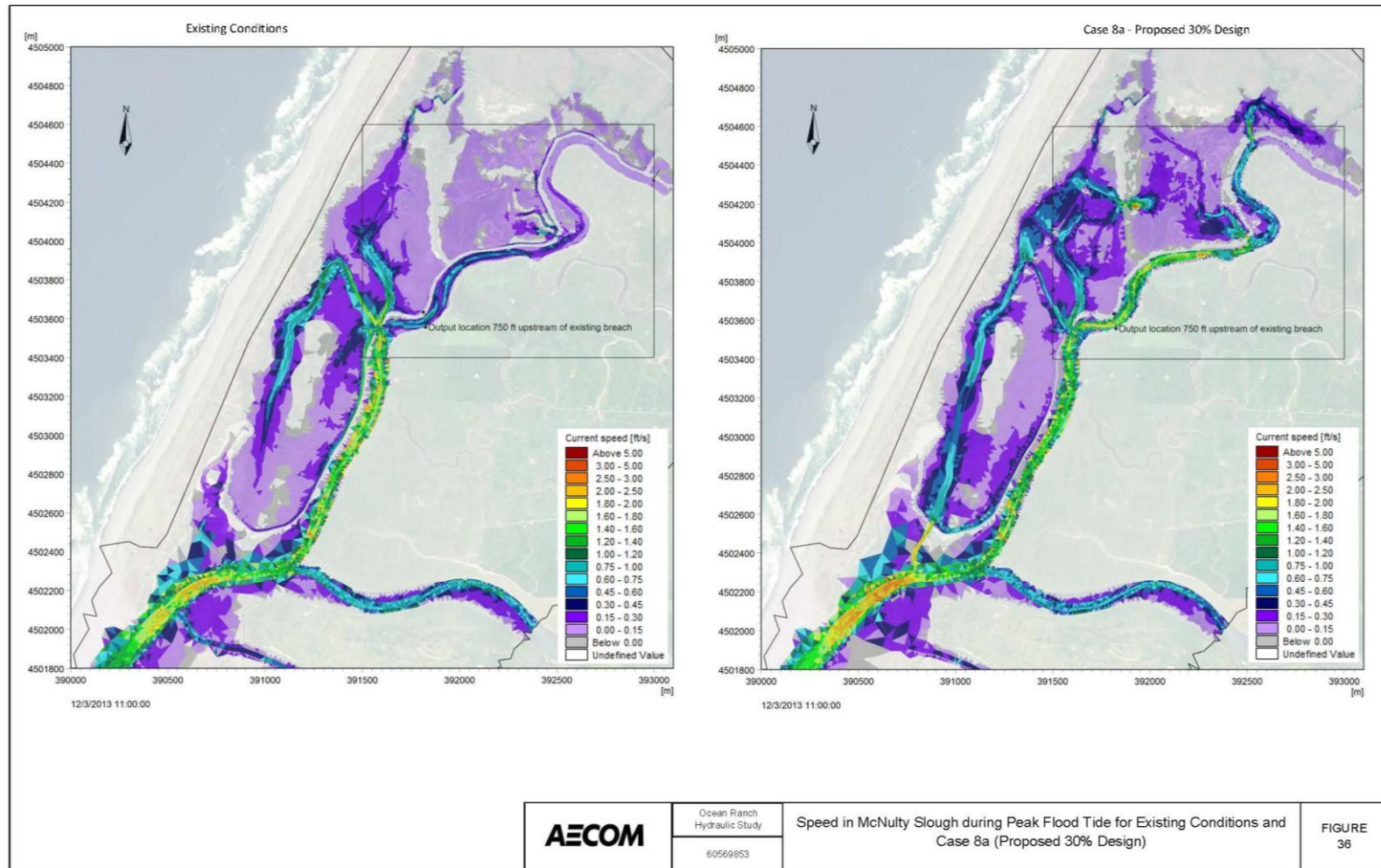


California Department of Fish and Wildlife
Ocean Ranch Restoration Project

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Revision No. -
Date 6/25/2020

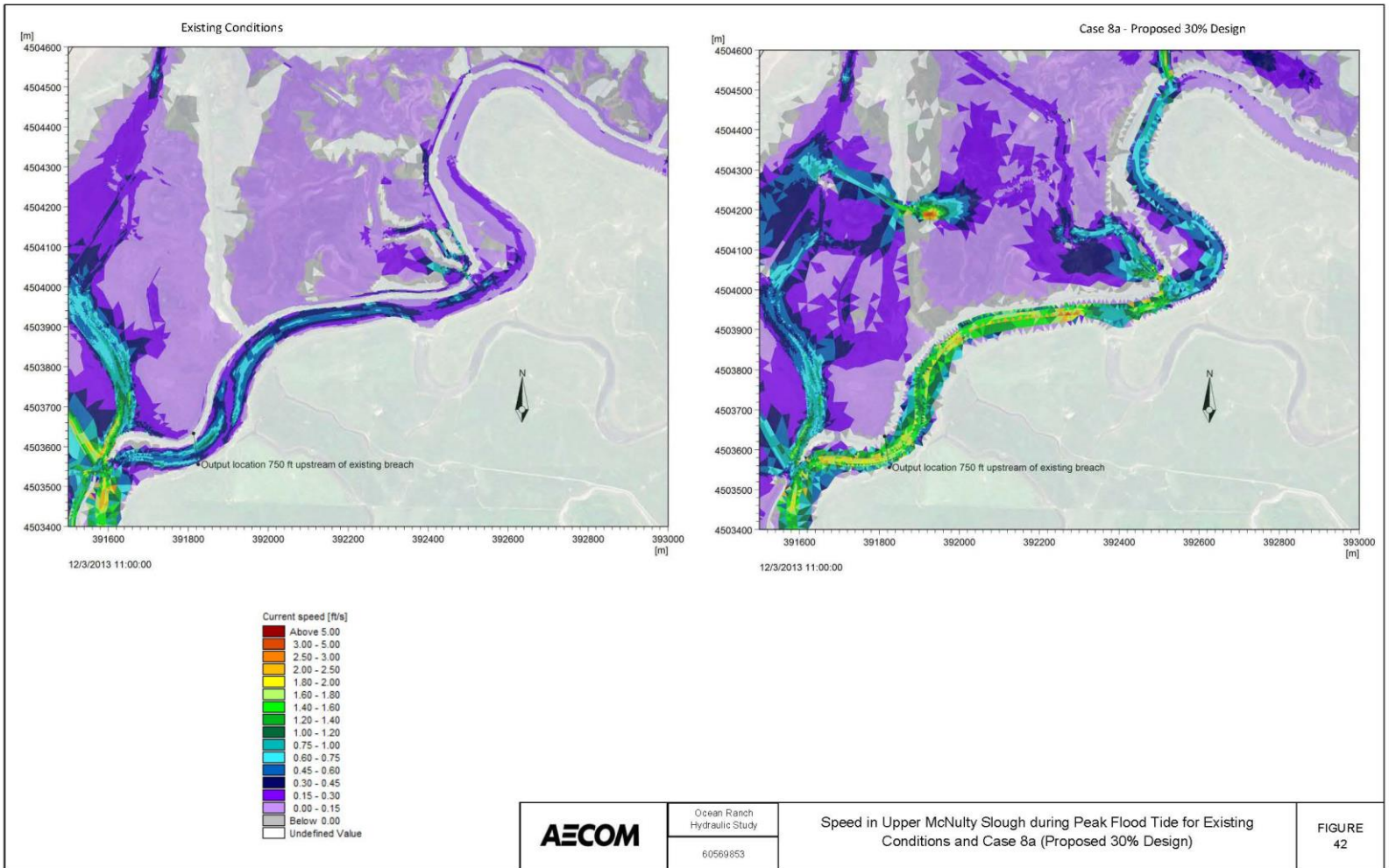
1888 Map of the Eel River Estuary

FIGURE 3.9-5



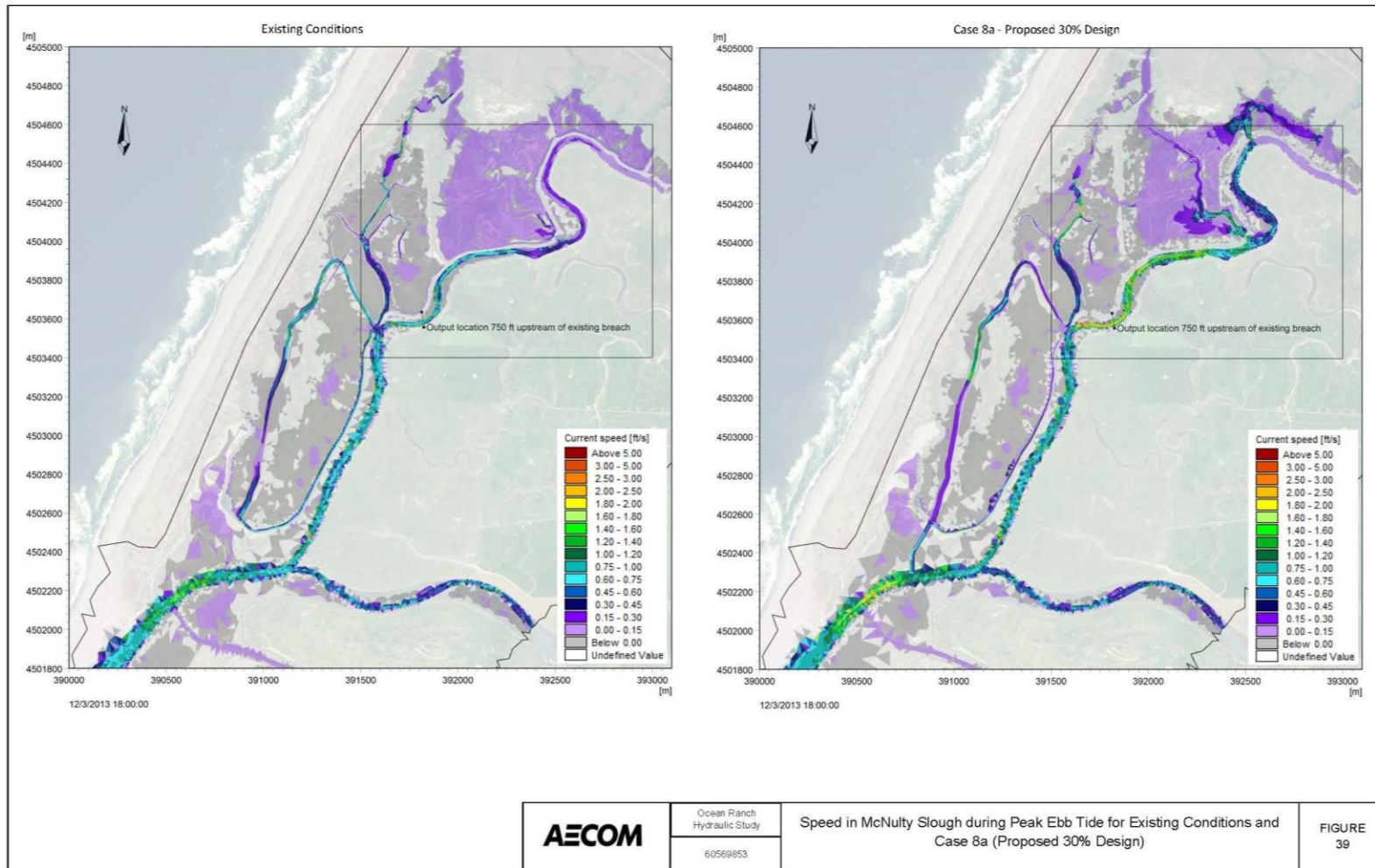
Source: AECOM 2019

Figure 3.9-6 Speed in McNulty Slough During Peak Flood Tide for Existing Conditions and Case 8a (Project)



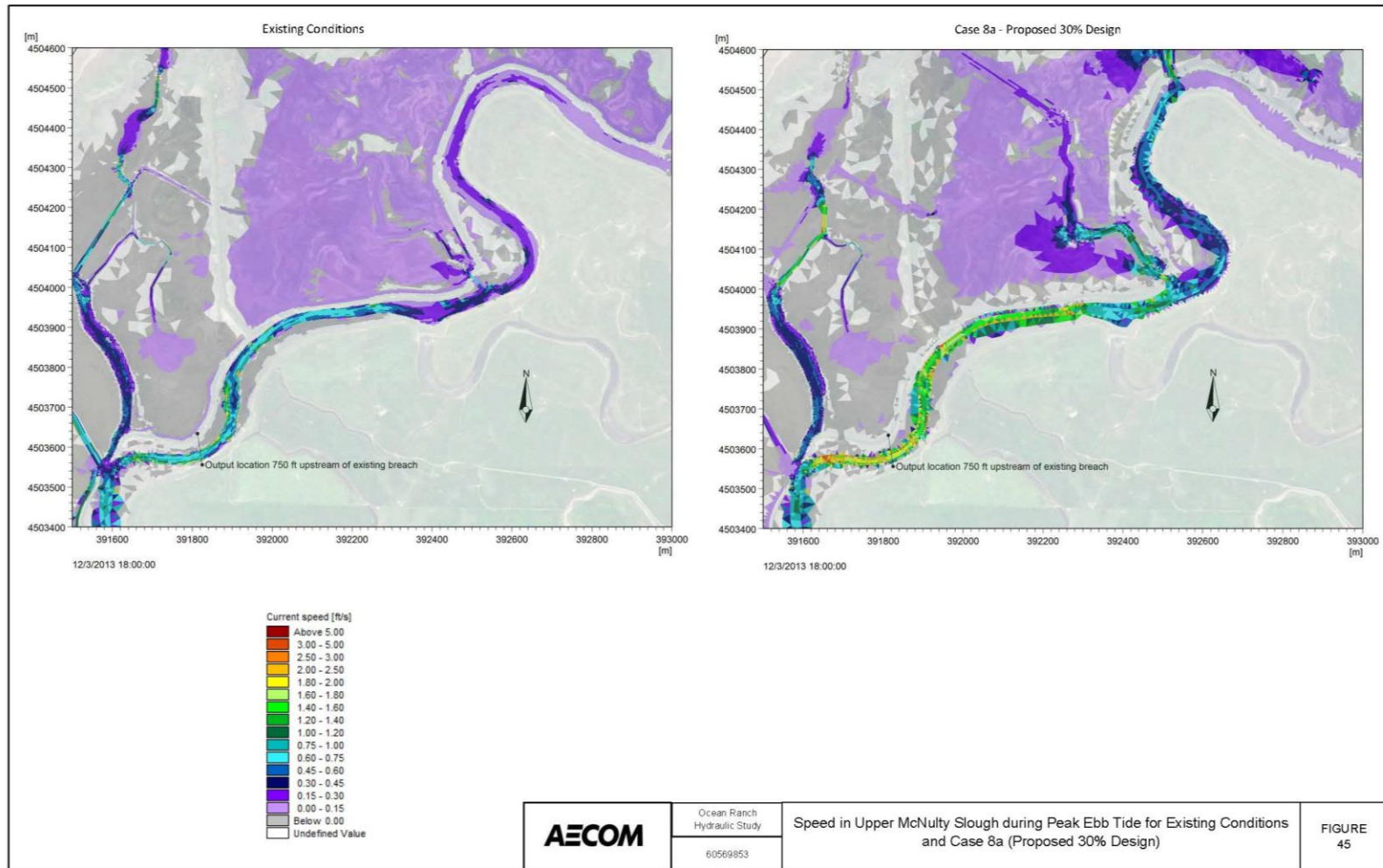
Source: AECOM 2019

Figure 3.9-7 Speed in Upper McNulty Slough During Peak Flood Tide for Existing Conditions and Case 8a (Project)



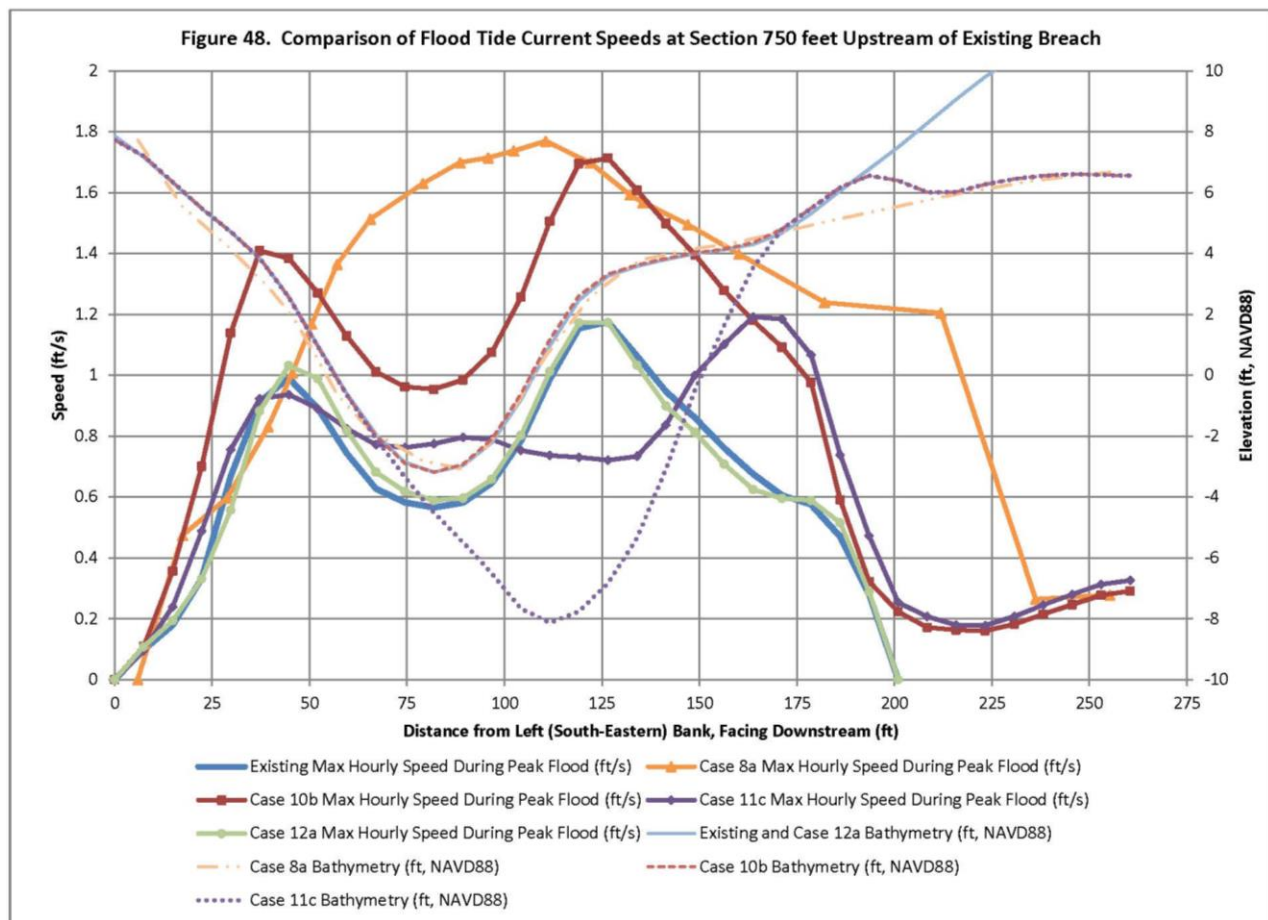
Source: AECOM 2019

Figure 3.9-8 Speed in McNulty Slough During Peak Ebb Tide for Existing Conditions and Case 8a (Project)



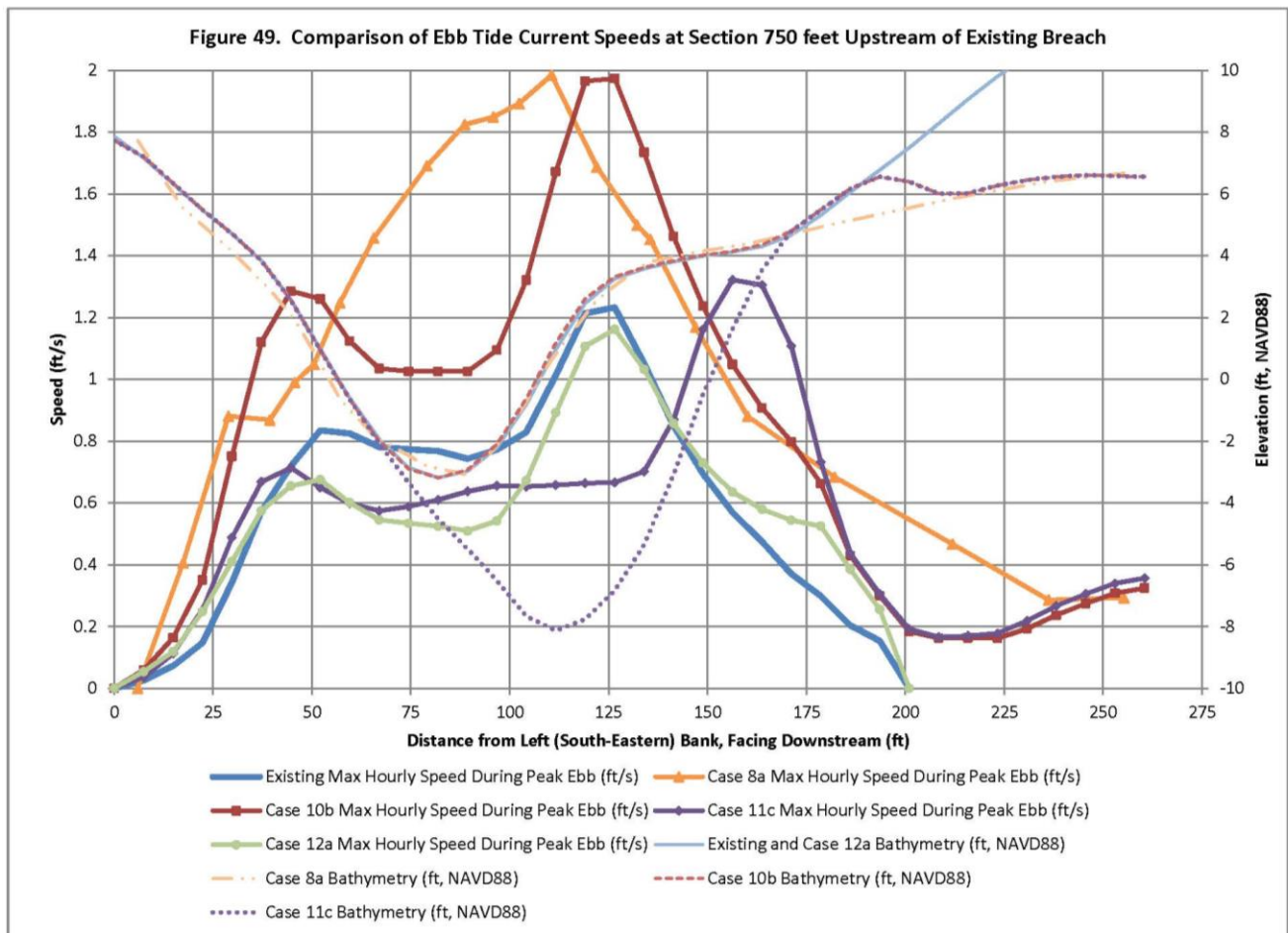
Source: AECOM 2019

Figure 3.9-9 Speed in Upper McNulty Slough During Peak Ebb Tide for Existing Conditions and Case 8a (Project)



Source: AECOM 2019

Figure 3.9-10 Comparison of Flood Tide Current Speeds at Section 750 Feet Upstream of Existing Breach



Source: AECOM 2019

Figure 3.9-11 Comparison of Ebb Tide Current Speeds at Section 750 Feet Upstream of Existing Breach

3.10 Land Use and Planning

This section contains a discussion of the existing land uses in the study area, and evaluates the potential impacts related to land use and planning during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. For this section the study area is the same as the Project Area.

3.10.1 Setting

Existing Land Use

The study area is located near the community of Loleta, in Humboldt County. It is generally bounded by the Pacific Ocean to the west, North Bay to the south, McNulty Slough to the east and Table Bluff to the north. As described in Chapter 2, Project Description, the study area is located in the Ocean Ranch Unit (ORU) of the approximate 2,600 acre (1,052 hectare) Eel River Wildlife Area (ERWA), which has been owned by the California Department of Fish and Wildlife (CDFW) since 1951, and managed for fish and wildlife habitat and wildlife-oriented public recreational use.

Historically, much of the area that is now the ORU was estuarine saltmarsh. Sometime between 1916 and 1948, the saltmarsh portion of the ORU was diked, isolated from tidal waters, and drained to create pasture through tide gates to McNulty Slough. In 1986, the Ocean Ranch property was acquired by CDFW to be managed as shallow freshwater habitat for waterfowl and other native wildlife (see Figure 2-2 Project Area). The Ocean Ranch property was divided into five distinct management areas, denoted as Areas A through E. In 1994, a levee breach occurred along McNulty Slough and caused flooding of Area A. The breach, in combination with subsequent failures of other water control structures within Ocean Ranch and between Ocean Ranch, McNulty Slough and North Bay have resulted in decisions to discontinue management and maintenance of artificial freshwater wetland habitat, and have allowed most of the area to revert to saltmarsh and/or brackish marsh.

The Project Area currently has approximately 3.5 miles (5.6 kilometers) of ocean front dunes dominated by invasive European beachgrass, as well as slough channels, mud flats, tidally inundated saltmarsh dominated by invasive dense-flowered cordgrass, historic dikes, and some brackish and freshwater wetlands.

The predominant use of the study area is wildlife habitat, where a diverse variety of species utilize habitats onsite, including a large assemblage of fishes; marine mammals; numerous birds, including raptors, waterfowl, shorebirds, and songbirds;

amphibians; and reptiles. Primary recreational uses include hunting, wildlife viewing, art, science, spiritual rejuvenation, contemplation, and social gathering.

Surrounding Land Uses

Land uses in the vicinity of the study area are dominated by agriculture. Recreational opportunities exist north of the study area at the Table Bluff County Park and the South Spit Wildlife Area, as well as southeast of the study area at Crab Park. As noted above, the Project is located within the ERWA, which extends south and east of the study area and contains saltmarsh, pasture, wet meadow, brackish marsh, and coastal scrub. The ERWA also includes one of the largest riparian forests remaining on California's North Coast (CDFW 2018). A wide variety of wildlife utilize the ERWA and recreational uses include fishing, wildlife viewing, birdwatching, hiking and hunting.

General Plan Land Use and Zoning

Lands within the study area are owned by CDFW or are under the jurisdiction of the State Lands Commission (SLC) and are not subject to land use review by Humboldt County. Therefore, a discussion of local and regional land use, planning, or regulatory policies are not included in this section. The following paragraphs specific to the Humboldt County land use designations, zoning, and permitted uses for the study area are included for informative purposes, and to provide context for other analyses in this Draft EIR where the study area has been expanded and where local land use planning policies may apply (see Section 3.0, Introduction).

The study area is located on land designated as predominantly Agricultural Exclusive, and Commercial Recreation in the Humboldt County General Plan. The zoning of the study area is primarily Agriculture Exclusive, 60-acre (24 hectares) minimum (AE-60), combined with Coastal Wetlands (W), Flood Hazard Areas (F), Streams and Riparian Corridor Protection (R), and Transitional Agricultural Lands (T). Principally permitted uses in the AE-60 zone include single family residential, general agriculture, timber production, and cottage industries. Conditionally permitted uses in the AE-60 zone include wetland restoration, fish and wildlife management, watershed management, resource-related recreation and coastal access facilities. Zoning at the northern extent of the study area is Commercial Recreation (CR) with a combining zone of Beach and Dune Areas (B). The principally permitted use in the CR zone includes public recreation. Conditionally permitted uses in the CR zone include a variety of residential, civic, commercial and natural resources uses including fish and wildlife habitat management, watershed management, and wetland restoration. The zoning of slough and other portions of the study area 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, access way development and improvement and removal of trees for firewood, disease control and public safety purposes.

3.10.2 Regulatory Framework

Federal

There are no federal land use plans, policies or regulations pertaining to the Project.

State

State Lands Commission Policy

The SLC is a trustee agency for projects that could directly or indirectly affect sovereign land and their accompanying Public Trust resources or uses. Additionally, because the Project involves work on sovereign land, the SLC will act as a responsible agency under CEQA.

The SLC has jurisdiction and management authority over all ungranted tidelands, submerged lands, and the beds of navigable lakes and waterways across California. The SLC also has certain residual and review authority for tidelands and submerged lands legislatively granted in trust to local jurisdictions. All tidelands and submerged lands, granted or ungranted, as well as navigable lakes and waterways, are subject to the protections of the common law Public Trust Doctrine.

The State of California acquired sovereign ownership of all tidelands and submerged lands and beds of navigable lakes and waterways upon its admission to the United States in 1850. The state holds these lands for the benefit of all people of the state for statewide Public Trust purposes, which include but are not limited to waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation and open space. On tidal waterways, the state's sovereign fee ownership extends landward to the mean high water line, except for areas of fill or artificial accretion or where the boundary has been fixed by agreement or a court (SLC 2018a).

Lands owned by the state and which are under the jurisdiction of the SLC may be leased for such purpose or purposes as the SLC deems advisable including but not limited to, grazing leases and leases for commercial, industrial and recreational purposes. The Project Area is currently under a 49-year General Permit Lease Number PRC 7153.9, granted in 1988, which authorizes levee construction and maintenance for wildlife habitat restoration. The Project, which includes estuarine restoration, would occur within the lease area on tidally influenced state sovereign land and is authorized under the current lease (SLC 2018b).

A portion of the dune restoration area is located outside of the lease area and is on lands the state acquired as swamp and overflowed land. The SLC subsequently transferred jurisdiction and control of the land to CDFW but retained control over all minerals. Upon review of information and SLC records, the SLC has determined that the activities proposed for the dune restoration area will not affect minerals under the jurisdiction of the SLC (SLC 2018b).

Although a lease amendment is not required, the SLC policy pertaining to amendments, modifications or revocations to granted tidal or submerged lands is listed below.

Public Resources Code, Division 6. Public Lands, Part 2. Leasing of Public Lands.

Chapter 2. Development and Improvement of Granted Tide and Submerged Lands [6701-6707]

6701. Subject to the provisions of Section 6702, no amendment, modification, or revocation, in whole or in part, of any grant of tide or submerged lands heretofore made or that may be hereafter made by the Legislature shall impair or affect the rights or obligations of third parties, including lessees, lenders for value, holders of contracts conferring the right to the use and occupation of, or the right to conduct operations upon or within such lands, arising from leases, contracts, or other instruments lawfully entered into prior to the effective date of such amendment, modification or revocation.

California Coastal Act Policy

The Project is within the California's Coastal Zone. Multiple California Coastal Act (Coastal Act) policies governing land and marine resources apply to the 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 30230 Marine resources; maintenance

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine

environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 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 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.*
- (4) 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.*
- (5) Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (6) Restoration purposes.*
- (7) 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.

- (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 Prime agricultural land; maintenance in agricultural production

The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas' agricultural economy, and conflicts shall be minimized between agricultural and urban land uses through all of the following:

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

The Project is funded in part by the National Oceanic and Atmospheric (NOAA) Restoration Center through a Community-Based Restoration Program (CRP) Grant. As a federal funding agency, the NOAA Restoration Center has requested the

California Coastal Commission (CCC) review the Project using the Federal Consistency review process described in the Coastal Zone Management Act (CZMA), rather than through issuance of a Coastal Development Permit. Subject to the federal consistency provisions of CZMA, the NOAA Restoration Center will submit a Consistency Determination to the CCC that includes a detailed description of the Project, a discussion of anticipated coastal effects, and an evaluation of the Project's consistency with the policies of the Coastal Act, as well as a statement indicating that Project will be undertaken in a manner that is consistent to the maximum extent practicable with the California Coastal Management Program.

Regional and Local

As described above, lands within the Project Area are owned by CDFW or are under the jurisdiction of the SLC and are not subject to land use review by Humboldt County. Therefore, a discussion of local and regional land use, planning, or regulatory policies are not included in this section.

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; or
- Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect.

3.10.4 Methodology

As described above, the study area for land use and planning is the same as the Project Area, and contains uplands, tidal lands and submerged lands. A significant impact would occur if implementation of the Project would result in inconsistencies or conflicts on these lands with the adopted goals and policies of applicable rules and regulations of the Coastal Act or SLC.

Areas of No Project Impact

Construction, invasive plant management and maintenance of the Project would not result in impacts related to one of the significance criterion identified in Appendix G of the current CEQA Guidelines. Because the Project would not impact the following significance criteria, this criterion is not discussed further in the impact analysis:

- **Would the Project physically divide an established community?** There are no residential uses within the study area and the study area is not part of an established community. The nearest community is Loleta, located approximately four miles (6.4 kilometers) to the east. No aspect of the Project would physically divide the community of Loleta or other established community.

3.10.5 Impacts and Mitigation Measures

Impact: LU-1: Would the Project cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

The study area has been managed for wetlands and wildlife habitat for nearly five decades. The Project would improve the tidal hydrologic function onsite and would not cause a major deviation from the land uses practiced onsite for the last fifty years.

The wetlands and slough features within the study area were modified in the early part of the 20th century through the construction of levees which created “dry” land conditions able to support agricultural use. The study area has not been utilized for agricultural use since the 1980’s, however approximately 28 acres (11.3 hectares) of the study area is considered to contain prime farmland if irrigated (NRCS 2017). This soil type is thought to be a remnant feature resulting from the land modifications described above, which is further discussed in Section 3.2 (Agricultural & Forestry Resources).

The CCC has jurisdiction over the study area and requires projects be consistent with the Coastal Act. California Coastal Act Sections 30001.5, 30230, 30233, and 30241 were determined to be applicable to the Project. Section 30001.5 focuses on the protection, restoration, and conservation of coastal resources, as well as maximizing access to coastal resources. Section 30230 focuses on maintaining, enhancing, and, where feasible, restoring marine resources. Section 30233 lists the allowable reasons for diking, filling, or dredging within the coastal zone. Section 30241 seeks to maintain the maximum amount of prime agricultural land, to ensure the protection of the area’s agricultural economy, and minimize conflicts between agricultural and urban land uses. The Project’s primary purpose is habitat restoration and improved public access. The Project would restore and enhance the Project Area through restoration of 571 acres (231 hectares) of saltmarsh, and 279 acres (113 hectares) of coastal dunes, as well as provide additional recreational opportunities through creation of a non-motorized trail system, boat put-in, and other recreational amenities. Restoration is also an allowable reason for diking, filling, or dredging within the coastal zone. Accordingly, the Project would be consistent with Section 30001.5, 30230, and 30233 of the Coastal Act.

In regards to Section 30241, although the study area contains some land designated as Prime Farmland, implementation of the Project would not interfere with agriculture production nor would it convert the prime farmland to an urban use. The study area is not currently being utilized for agricultural use – and has not been for nearly 30 years - and therefore would not conflict with Section 30241 of the Coastal Act. A discussion of how the Project complies with other agriculture-related policies of the Coastal Act is provided in Section 3.2 (Agriculture and Forestry Resources). In addition, the NOAA Restoration Center will submit a Consistency Determination to the CCC to verify the Project is consistent to the maximum extent possible with the Coastal Act.

The lease granted to CDFW by SLC regarding all lands under their jurisdiction authorizes improvements to the levee and tide gate system in the study area for maintenance and enhancement of wildlife values of the area (SLC 1987). The SLC reviewed all activities proposed under the Project in October 2018 and determined that implementation of the Project would not require a new or amended lease (SLC 2018b).

In conclusion, the Project would not conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project including the CCC or SLC. Accordingly, no impact on land use or planning would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No impact.

3.10.6 Cumulative Impacts

Impact: LU-C-1: Would the Project contribute to a cumulatively significant impact related to land use and planning?

As discussed in Section 3.10.4, the Project would not result in impacts relative to dividing an established community. Therefore, implementation of the Project would not contribute to any related cumulative impact on any community in the vicinity. As discussed in Impact LU-1, the Project would not conflict with an applicable land use plan, policy or regulation of an agency with jurisdiction over the Project; because there is no impact related to land use planning, the Project would not contribute to any related cumulative impact.

Mitigation Measures: No mitigation is necessary.

Level of Significance: No Impact.

3.10.7 References

California Department of Fish and Wildlife (CDFW). 2018. Eel River Wildlife Area. Available at: <https://www.wildlife.ca.gov/Lands/Places-to-Visit/Eel-River-WA>

Humboldt County. 2017. General Plan, October.

Humboldt County. 1989. Humboldt County General Plan Volume II Eel River Area Plan of the Humboldt County Local Coastal Program, October.

Natural Resources Conservation Service (NRCS). 2017. Web Soil Survey, Farmland Classification, November.

State Lands Commission (SLC). 1987. Lease, July.

State Lands Commission (SLC). Mail correspondence, Subject: Notice of Preparation (NOP) for a Draft Environmental Impact Report (EIR) for the Ocean Ranch Restoration Project, Humboldt County (July 16, 2018a)

State Lands Commission (SLC). Mail correspondence, Subject: Ocean Ranch Restoration Project, Humboldt County (October 29, 2018b).

3.11 Noise

This section evaluates potential impacts on humans related to noise and vibration during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The study area for this section includes the Project Area and adjacent lands where sensitive noise receptors may be impacted by noise that is expected to occur from implementation of the Project.

3.11.1 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 the 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 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 3.11-1.

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 L_{eq} can describe any series of noise events of arbitrary duration.

Since the sensitivity of noise receptors 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 (L_{dn}) 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 5 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 3.11-1 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.
L_{01} , L_{10} , L_{50} , L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Equivalent Noise Level, L_{eq}	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, L_{dn} 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.
L_{max} , L_{min}	The maximum and minimum A-weighted noise level during the measurement period.

Term	Definitions
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-inch per second (in/sec) and reported in velocity decibels (VdB). PPV and VdB vibration velocity amplitudes are used in this analysis to evaluate the effect of vibration on buildings and people in the vicinity of construction activities.

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 a building. Construction-induced vibration that can be detrimental to a 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 vicinity are associated with agricultural operations along the eastern and southern boundaries of the Project Area and the Pacific Ocean along the western boundary of the Project Area. Sources include irrigation equipment, diesel generators, forklifts, livestock, tractors, and other vehicles and equipment. 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. Noise within the Project Area is associated with seasonal hunting, offsite agricultural operations, several nearby rural residences, Table Bluff County Park, privately owned non-residential land, and vehicles passing by on Table Bluff Road and Copenhagen Road. Due to the Project location along the coast, 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 include residential areas, schools, convalescent and acute care hospitals, parks and recreational areas, and churches and other religious facilities. The only off-site sensitive receptors identified near the Project Area are rural residences. The closest residences in the Project vicinity are located northeast of the site along Indianola Reservation Road, which was previously part of the Wiyot Tribe’s Table Bluff Reservation. The nearest residence is located approximately 350 feet (107 meters) northeast of the Area D boundary and approximately 3,600 feet (1,097 meters) east of the Area A boundary.

3.11.2 Regulatory Framework

Federal

No federal standards related to noise and vibration would be applicable to the Project.

State

California Department of Transportation – Construction Vibration

Caltrans recommends a vibration limit of 0.5 in/sec PPV for buildings structurally sound and designed to modern engineering standards. A conservative vibration limit of 0.25 to 0.30 in/sec PPV has been used for older buildings that are found to

be structurally sound but cosmetic damage to plaster ceilings or walls is a major concern. For historic buildings or buildings that are documented to be structurally weakened, a conservative limit of 0.08 in/sec PPV is often used to provide the highest level of protection. All of these limits have been used successfully and compliance to these limits has not been known to result in appreciable structural damage. All vibration limits referred to herein apply on the ground level and take into account the response of structural elements (i.e., walls and floors) to groundborne excitation (Caltrans 2013).

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Potential impacts within each resource category extending beyond the Project boundary, such as noise impacts on adjacent land uses, are analyzed utilizing local regulatory documents such as the Humboldt County General Plan and the Local Coastal Program Eel River Area Plan. Applicable local and regional regulatory policies are summarized below.

Humboldt County General Plan: Noise Element Standards

The Noise Element of the Humboldt County General Plan sets forth policies related to noise and land use compatibility. The most applicable policies to the proposed Project are listed below:

- N-P1. Minimize Noise from Stationary and Mobile Sources. Minimize stationary noise sources and noise emanating from temporary activities by applying appropriate standards for average and short-term noise levels during permit review and subsequent monitoring.
- N-S7. Short-term Noise Performance Standards (Lmax). The following noise standards, unless otherwise specifically indicated, shall apply to all property within their assigned noise zones and such standards shall constitute the maximum permissible noise level within the respective zones.

Table 3.11-2 Short-term Noise Standards (Lmax)

Zoning Classification	Day (maximum) 6:00 a.m. to 10:00 p.m.	Night (maximum) 10:00 p.m. to 6:00 a.m.
MG, MC, AE, TPZ, TC, AG, FP, FR, MH	80	70
MB, ML, RRA, CG, CR C-1, C-2, C-3	75	65
RM, R-3, R-4	65	60
RS, R-1, R-2	65	60

Exceptions:

The short-term noise levels shown in the above table shall not apply to certain uses, including but not limited to the following:

1. Portable generator use in areas served by public electricity when electrical service is interrupted during emergencies as determined by the Planning Director.
2. Temporary events in conformance with an approved Conditional Use Permit.
3. Use of chainsaws for cutting firewood and power equipment used for landscape maintenance when accessory to permitted on-site uses.
4. Heavy equipment and power tools used during construction of permitted structures when conforming to the terms of the approved permit.
5. Emergency vehicles.

3.11.3 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 the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- Result in generation of excessive groundborne vibration or groundborne noise levels; or
- Located within the vicinity of a private airstrip or 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.

Areas of No Project Impact

As explained below, the Project would not result in impacts related to one of the significance criteria identified in Appendix G of the current CEQA Guidelines:

- **Located within the vicinity of a private airstrip or 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 the vicinity of a private airstrip, an airport land use plan, or within two miles of a public airport. Therefore this significance criterion is not applicable and is not discussed further.

3.11.4 Methodology

The noise and vibration impact assessment evaluates both short term construction noise and noise associated with long-term maintenance and invasive plant management activities. For purposes of this discussion, short-term impacts from implementation of the estuarine restoration portion of the Project assume a two-field-season construction period, with each season extending approximately 180 days between May and October. Upon completion of the estuarine restoration portion of the Project, invasive plant management activities would cause occasional

increases in noise above background levels in various locations throughout the study 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 invasive plant management and maintenance noise, the potential for impacts was assessed by evaluating the noise generation potential of invasive plant management and maintenance activities and recreational uses, proximity of sensitive receptors, and the potential for such noise to exceed 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. As described above, 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. Based on Caltrans guidance, this analysis establishes 0.08 in/sec PPV given the presence of structurally weakened buildings located in the Project Area and local vicinity.

3.11.5 Impacts and Mitigation Measures

Impact NOI-1: Would the Project result in generation of a substantial temporary or permanent increase in ambient noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

To evaluate the Project's potential noise impacts on adjacent land uses, this evaluation utilizes Humboldt County's Short-term Noise Performance Standards established in General Plan Policy N-S7. The Short-term Noise Performance Standards identify a threshold of 65 dBA L_{max} at residential land uses during the daytime (6:00 a.m. to 10:00 p.m.) and a 60 dBA L_{max} during the night-time (10:00 p.m. to 6:00 a.m.). The Project would only generate noise during the daytime due to the proposed construction and maintenance hours.

Several residences are located along Indianola Reservation Road northeast of the Project Area and Copenhagen Road east of the Project Area. The residences along Indianola Road are in relatively close proximity (350 feet [107 meters]) to the Project Area, with the second closest residential land uses located along Copenhagen Road being approximately 3,600 feet (1,097 meters) east of Area A.

During the construction phase, the potential exists for intermittent noise levels to exceed the 65 dBA L_{max} threshold at the residential use within 350 feet of Area D. Table 3.11-3 summarizes the noise levels produced by various types of construction equipment. Activities such as channel excavation, levee lowering/removal, installation of ditch blocks, and high marsh elevation fill would occur within the

Project Area. The types of construction equipment used for earthmoving typically generates noise levels between 70–85 dBA at a distance of 50 feet (15 meters) when the equipment is operating. 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 85 dBA (e.g., a grader) as measured at 50 feet (15 meters) from the noise source would attenuate to 79 dBA at 100 feet (30 meters) from the source, to 73 dBA at 200 feet from the source, and to 67 dBA at 400 feet from the source. Given that some construction equipment used under the Project could generate noise levels as high as 85 dBA at 50 feet (15 meters), and that that noise would only attenuate to about 67 dBA at 400 feet, the residences located 350 feet (107 meters) from Area D may be exposed to noise that exceeds the County's 65 dBA threshold when construction occurs in Area D. The residential uses located along Copenhagen Road are located approximately 3,600 feet (1,097 meters) east of Area A, and construction noise would attenuate well below 65 dBA L_{max} threshold at this distance.

Table 3.11-3 Construction Equipment Noise Emission Reference Levels

Equipment Description	Actual Measured Lmax @ 50 feet (dBA) (Samples Averaged)
Bulldozer	85
Chainsaw	85
Compactor (ground)	83
Crane	81
Drum Mixer	80
Dump Truck	76
Excavator	81
Flat Bed Truck	74
Front Bed Loader	79
Grader	85
Generator	81
Pickup Truck	75
Pneumatic Tools	85
Roller	80
Tractor	84
Pumps	81

Source: U.S. Department of Transportation 2006

Although Project construction activities may exceed the County's short-term noise standard, Policy N-S7 lists exceptions to the thresholds, including heavy equipment and power tools used during construction. Therefore, the temporary noise increase that could exceed the short-term residential threshold would be an exception and considered a less than significant impact.

Invasive plant management activities would occur in several areas, including Area D. The invasive plant management activities in Area D would focus on dense-flowered cordgrass removal. In the first year of invasive plant management, one primary treatment, such as mowing and grinding, and one secondary treatment, such as prescribed burning or herbicide application, would be implemented, with follow-up treatments conducted annually thereafter, as needed and as funding allows for up to ten years or as long as needed to achieve control and/or eradication. Implementation of the primary treatment may utilize hand-held gas-powered equipment or other heavy equipment. The use of heavy equipment could result in an intermittent increase in the noise environment.

As the closest sensitive receptor is located 350 feet (107 meters) northeast of Area D, noise levels could slightly exceed the County's 65 dBA L_{max} short-term noise threshold for residential uses. However, an exception to the short-term noise thresholds includes use of chain saws and other equipment for landscape maintenance. As the proposed invasive plant management activities would utilize similar equipment to what is utilized for landscape management, the noise at the closest sensitive receptors would be similar or less than what would occur during landscape management activities. Therefore, noise associated with invasive plant management activities within Area D would be less than significant. Noise associated with invasive plant management in other locations within the Project Area would be located further away from sensitive receptors and would not exceed any applicable policy or threshold.

Once invasive plant management activities are completed, the noise environment is anticipated to be similar to existing conditions and would not result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or applicable standards of other agencies.

Mitigation Measures: No mitigation 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 includes breaching and lowering levees, constructing tidal channels, and installing recreational components. Major sources of groundborne vibration, such as the use of impact pile drivers, are not proposed as part of the Project. Sheet piles may be placed for temporary water control. If used, sheet piles would be advanced or pushed into the ground with an excavator.

Table 2-4 in Chapter 2 (Project Description), was reviewed 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 estuarine restoration portion of the Project. Table 3.11-4 presents the

vibration levels that could be expected from identified construction equipment at a distance of 25 feet (8 meters). As indicated in Table 3.11-4, vibration levels produced by a large bulldozer could reach 0.089 in/sec, PPV at a distance of 25 feet (8 meters). Vibration levels would vary depending on soil conditions, construction methods, and equipment used.

Table 3.11-4 Vibration Source Levels for Project Construction Equipment

Equipment	PPV at 25 feet (in/sec)	Approximate Lv at 25 feet (VdB)
Large bulldozer	0.089	87
Loaded trucks	0.076	86
Small bulldozer	0.003	58

Source: U.S. Department of Transportation 2006

The nearest sensitive receptor would be located more than 300 feet (91 meters) from the nearest earthwork. At that distance vibration levels would be well below the 0.08 in/sec PPV threshold used to avoid cosmetic damage to buildings that are very old or buildings that are documented to be structurally weakened. Vibration levels produced by other equipment proposed as part of the Project and at locations further from receptors would also be well below the 0.08 in/sec PPV threshold. A barn is located outside of the Project Area, adjacent to where a parking lot is proposed. It is not anticipated any of the equipment utilized in this area would generate substantial levels of vibration. Loaded trucks that may pass through the area generate 0.076 in/sec PPV of vibration, which is below the 0.08 in/sec PPV threshold. Therefore, it is not anticipated that the barn would be affected by vibration generated by Project activities. The impact would be less than significant.

Invasive plant management would occur seasonally for up to ten years or as long as needed to achieve control and/or eradication. The management techniques include mowing, grinding, excavation, mechanical removal, prescribed burning, and/or herbicide application methods. Mechanical removal of the invasive plant species may utilize a bulldozer or an excavator, which could result in vibration. As described above, the use of construction equipment on the site would not result in groundborne vibration proximate to or significant enough to damage any existing structures. As a result, this impact would be less than significant.

Maintenance activities would be infrequent and temporary and would typically not involve the use of heavy equipment. No vibrations or ground disturbance is anticipated. No impact from maintenance activities would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.11.6 Cumulative Impacts

Impact NOI-C-1: Would the Project contribute to a cumulatively significant impact from noise?

As discussed in Section 3.11.3, the Project would not result in impacts relative to being located near a public airport or private airstrip. Therefore, implementation of the Project would not contribute to any related cumulative impact on these resources.

The Project would have less-than-significant noise impacts relative to local standards (Impact NOI-1) and vibration impacts (Impact NOI-2). Similar to the Project, implementation of cumulative projects identified in Table 3-1 (Projects Considered for Cumulative Impacts), such as the Salt River Ecosystem Restoration Project and the Eel River Estuary Preserve and Centerville Slough Enhancement, may result in the generation of construction noise and construction-related vibration impacts. However, the distance between the Project Area and the identified cumulative projects would prevent the potential for cumulative impacts in the Project Area related to noise levels and vibration, and the cumulative impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.11.7 References

California Department of Transportation. 2013. Transportation Noise and Construction Vibration Guidance Manual. September.

Humboldt County. 2017. Humboldt County General Plan: Chapter 13. Noise Element. Eureka, CA. Retrieved from: <https://humboldt.gov/DocumentCenter/View/61989/Chapter-13-Noise-Element-PDF>

U.S. Department of Transportation, Federal Highway Administration (U.S. DOT FHWA). 2006. Construction Noise Handbook, August.

3.12 Public Services and Utilities

This section evaluates the potential impacts from construction, invasive plant management, and maintenance of the Project relative to public services and utilities. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. Potential impacts from public access related to public services and utilities are also considered in this section. 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 study area for public services and utilities is the same as the Project Area.

3.12.1 Setting

Public Services

Fire Protection

Founded in 1900, the Loleta Volunteer Fire Department (LVFD) is responsible for the preservation and protection of life and property for the community of Loleta and the surrounding rural area. The Loleta Fire Protection District (LFPD) is a special district responsible for providing fire protection services, through the LVFD, to the community of Loleta and the surrounding lands including the unincorporated communities of Table Bluff, Hookton Slough, the South Spit, a portion of Fernbridge, and the remainder of the Eel River bottoms north of the Eel River. The LFPD operates one fire station, located on Park Street, which is centrally located in downtown Loleta.

The active powers of the LFPD include fire protection and suppression services to all structures within the District's boundaries, water supply and storage for domestic and fire suppression purposes, basic and advanced life support services with paramedics for medical emergencies, as well as other services. While the LFPD is responsible for structural fire protection and emergency medical responses, California Department of Forestry and Fire Protection (CAL FIRE) retains responsibility for wildland fires. The LFPD has mutual aid agreements with similar nearby districts which 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 LFPD to maintain preparedness for a disaster beyond their capacity, without the need to expand and create an additional facility.

The LFPD has a district boundary of 49 square miles or 31,284 acres (12,660 hectares). The District's current boundaries encompass the area from the Pacific

Ocean on the west to the tip of the South Spit and southern edge of Humboldt Bay to the north, and to approximately 3 miles (4.8 kilometers) east of Tompkins Hill Road to the east, and to the Eel River and approximately 1 mile (1.6 kilometers) north of Fortuna on the southern border. The LFPD maintains three type 2 pumper fire engines, one water tender fire truck, one rescue unit, one type 3 wildlands truck, one type 4 attack truck, and one 1939 International Fire Engine. As of 2016, the Department has 29 volunteers trained as first responders (LAFCO 2008; Loleta Volunteer Fire Department 2016).

Law Enforcement Services

The Humboldt County Sheriff's Office provides a variety of public safety services (court and corrections services) countywide 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. The County Sheriff Patrol Unit 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 assistance 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, Sheriff's Office facilities are insufficient for current needs and the Sheriff does not have adequate funding to maintain generally accepted officer-to-population ratios (Humboldt County 2017).

Public Schools

The study area is located within the Loleta Unified Elementary School District. School age persons in the Project vicinity requiring public schooling from kindergarten through eighth grade attend Loleta Elementary School, located in Loleta. Public high school students attend Fortuna High School, located in Fortuna (Humboldt County Office of Education 2018).

Parks

The study area is located less than three miles (4.8 kilometers) from four recreational facilities: Table Bluff County Park, Crab County Park, the Pedrazzini Boat Ramp and the Humboldt Bay National Wildlife Refuge. These areas offer visitors access to the Eel River estuary by boat, wildlife viewing, and hiking opportunities. All are day-use only areas, contain parking lots, and do not require fees for use (Humboldt County 2018).

The study area is open to the public for recreational uses, including equestrian use, hiking, wildlife viewing and seasonal waterfowl hunting. Undeveloped and informal hiking trails are located within the study area primarily along levees and dispersed

within the dunes. Vehicle access into the estuarine portion of the study area is limited by a locked gate located at the north end of the study area off Table Bluff Road. Pedestrians and other non-motorized users can access the estuarine portion of the study area through an opening on the west side of the gate. Parking is currently located just north of the locked gate and has capacity for approximately three vehicles.

Utilities and Service Systems

Water Supply

No water companies or districts provide water to the Project Area. Historically a private well provided water to the Project Site. The surrounding rural areas are served by private wells and by the Loleta Community Services District (CSD). The Loleta CSD is located approximately 3.75 miles (6 kilometers) east of the study area (Humboldt LAFCO 2008b). According to the 2017 Humboldt County General Plan Update Draft Environmental Impact Report (DEIR) there are 258 existing municipal water service connections within the Loleta CSD, and 56 available to new users (Humboldt County 2017b).

Wastewater Treatment and Disposal

There are no wastewater treatment disposal facilities or septic systems in the study area. Wastewater treatment in most of the surrounding area is provided by private septic systems and through the Loleta CSD. According to the 2017 Humboldt County General Plan Update DEIR, there are 260 existing wastewater service connections within the Loleta CSD, and zero available to new users (Humboldt County 2017b).

Stormwater Infrastructure

The study area does not contain formal stormwater drainage infrastructure, only a drainage ditch occurs alongside the unpaved road entering the estuarine portion of the study area from Table Bluff Road. Tide gates may exist in neighboring agricultural properties located along slough channels and other waterways.

Solid Waste Collection and Disposal

There is no formal waste service at the study area. CDFW collects trash from the study area on an as needed basis and hauls it to one of the waste collection facilities in the Project vicinity, which include the Recology Eel River Center and Smith Lane Recycling Center in the City of Fortuna; a transfer station in the community of Redway; the Potrero Hills landfill located in Solano County; or the Dry Creek landfill located near Medford, Oregon .

Electricity and Natural Gas Infrastructure or Right of Ways

No electricity or natural gas pipeline system exists in the study area. Electricity and natural gas available in the Project vicinity is provided through Pacific Gas & Electric Company (PG&E).

Communications Infrastructure or Right of Ways

Frontier Communications and 101NetLink provide basic and long-distance telephone, dial-up internet and DSL service in the Project vicinity. Suddenlink

provides cable television and cable internet service. Cellular telephone service and satellite television are available from a variety of companies.

3.12.2 Regulatory Framework

Federal

There are no federal regulations governing public services and utilities that apply to the Project.

State

California Integrated Waste Management Act

The California Integrated Waste Management Act (CIWMA), also known as Assembly Bill 939, required each jurisdiction in the state to divert 50 percent of its solid waste from landfill or transformation facilities by 2000, and established a statewide diversion of 75 percent by 2020 for all municipal solid waste. The CIWMA also required each County to prepare a Countywide Integrated Waste Management Plan (CoIWMP), which is the main planning document for solid waste management in each County. Humboldt County's CoIWMP is the principal planning document for solid waste management in the county, addressing source reduction, household hazardous waste, and countywide landfill capacity needs.

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential impacts related to public services and utilities would be limited to the immediate Project Area, local and regional regulatory policies are not included in this analysis.

3.12.3 Evaluation Criteria and Significance Thresholds

The Project would be considered to have a significant impact on public services and utility 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;
- Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction of which could cause significant environmental effects;
- Have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years;

- 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;
- Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals; or
- Comply with federal, state, and local management and reduction statutes and regulations related to solid waste.

Areas of No Project Impact

Construction, invasive plant management and maintenance of the Project would not result in short term, long term or cumulative impacts relative to several of the evaluation criteria identified for public services and utilities. 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 induce population growth and, therefore, would not result in an increase in the local student population or the need for new or expanded schools. The Project would not require the expansion of additional recreational facilities to maintain service ratios in parks and would not require the expansion of other public facilities. Therefore, no impact would occur, and this significance criterion is not discussed further.
- **Would the Project require or result in the construction of new or expanded water, wastewater treatment, or storm water drainage, electric power, natural gas, or telecommunications facilities the construction or relocation of which would result in significant environmental effects, or have sufficient water supplies to serve the Project and reasonably foreseeable future development during normal, dry, and multiple dry years, or result in a determination by a wastewater treatment provider that it has adequate or inadequate capacity to serve the Project?** The Project would not include or require any wastewater, water, storm water drainage, electric power, natural gas, or telecommunications facilities. The Project would not directly or indirectly induce population growth in the community and would not increase the amount of wastewater or storm water generated or result in an increased demand for water, electric power, natural gas, or telecommunications. Therefore, the Project would not require or result in the construction of other facilities, and would not put a strain on the existing water supply, or create a shortage under normal, dry, and multiple dry year conditions. No impact would occur, and this significance criteria is 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 includes improvements to existing amenities including the parking area and road, and also includes the installation of a new parking area and multi-use trail system. The improved and proposed amenities would be surfaced with pervious

concrete or gravel. No new storm water drainage facilities are proposed at this time because precipitation would percolate through the pervious concrete or gravel and would not run off. No impact would occur, and this significance criteria is not discussed further.

3.12.4 Methodology

Potential impacts to public services and utilities are evaluated for construction, invasive plant management and maintenance 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. The evaluation also considers whether the Project would affect the capacity of the landfill that serves the Project, whether the Project would comply with federal, state, and local statutes and regulations related to solid waste, or impair attainment of solid waste goals.

3.12.5 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 contribute to an increase in 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 within the estuarine portion of the study area is currently low because a good portion is open wetlands kept moist by tidal inundation, summer fog, and periodic precipitation. The Project would reduce fire hazard in these areas by restoring a series of open tidal channels, and interconnected wetlands which would serve as a firebreak. In addition, the Project proposes to remove European beachgrass which would result in a dune vegetation that is sparser and less flammable than current conditions. Prescribed burning may be implemented to manage invasive plant species (both dense-flowered cordgrass and European beachgrass), and will require notification to the local CAL FIRE staff who will be on site during the burning; however, the demand on CAL FIRE would be limited in scope and duration and coordinated well in advance to avoid overextending staff. Finally, improvements to public facilities under the Project, including the access road and existing parking area, the addition of a new parking area and boat put-in, and formal trail system within the estuarine restoration area, would be wholly beneficial and maintained by CDFW as the land manager. 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 study area is patrolled by the Humboldt County Sheriff's Office and by CDFW Wildlife Officers. The majority of the study area is currently not regularly used by the public, although limited recreational use does occur and may increase after the Project is complete. The sand road within the dune restoration area is used for recreational access. However, recreational use of the dunes is not anticipated to increase substantially over current levels as a result of the Project. County roads in the Project vicinity are used by local walkers, joggers, equestrians, cyclists, and local vehicle traffic. Public access to the study area would be via Hookton Road to Table Bluff Road. The Project would not substantially increase use or access to the study area, or increase the area needing regular patrol by the Humboldt County Sheriff's Office or CDFW Wildlife Officers. 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.

Impact: PS-2: Would the Project generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals and comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

The Project would generate a minimal amount of solid waste during construction. Such waste may include damaged tide gates/culverts, abandoned fence posts and barbed wire, and general construction worker garbage. All sediment excavated to construct the Project would be reused onsite, and therefore not subject to offsite disposal. Similarly, invasive plants removed from the study area would not be off-hauled; rather they would be buried, burned, or otherwise left to biodegrade onsite. Project maintenance would not generate solid waste beyond removing incidental garbage or recycling left onsite by recreational users.

There are no active permitted in-County landfills. As a result, construction waste with no practical reuse that cannot be salvaged or recycled would be disposed of through Humboldt Waste Management Authority or Recology Eel River at either the Potrero Hills landfill or the Dry Creek landfill. Construction waste generated by the Project is estimated to be approximately 10 to 15 cubic yards, and would represent a small fraction of the daily permitted tonnage of local landfills. Therefore, the Project's construction-related solid waste disposal needs would be sufficiently accommodated by existing landfills and would not impair the attainment of solid waste reduction goals. The Project would not conflict with or impede implementation of management and reduction regulations related to solid waste. The impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.12.6 Cumulative Impacts

Impact: PS-C-1: Would the Project contribute to a cumulatively significant impact related to public services?

As discussed in Section 3.14.3, the Project would not result in impacts relative to the provision of new or physically altered governmental facilities for schools and parks, wastewater treatment capacity, water supply, storm water drainage, energy, natural gas, or telecommunications facilities. Therefore, implementation of the Project would not contribute to any related cumulative impact on these resources.

As discussed in Impact PS-1 and PS-2, the Project would have a less-than-significant impact relative to the provision of new or physically altered governmental facilities for fire and police protection, altered landfill capacity, or impediment of solid waste goals or regulations. Similar to the Project, implementation of cumulative projects identified in Table 3-1 (Projects Considered for Cumulative Impacts), such as the Eel River Estuary Preserve and Centerville Slough Enhancement Project, may result in additional recreational use and ongoing maintenance in the Project vicinity. The cumulative projects are predominantly restoration based, and similar to the Project, any increases in public access and maintenance would not be anticipated to result in a substantial increase for fire and police protection or need for waste management. Therefore, the cumulative impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.12.7 References

Humboldt County. 2017a. Humboldt County General Plan. October.

Humboldt County. 2017b. Humboldt County General Plan Update, Revised Draft Environmental Impact Report. April. Retrieved online at:
<https://humboldt.gov/DocumentCenter/View/61330/Final-Environmental-Impact-Report---Complete-Document-PDF>

Humboldt County. 2018. County Parks & Facilities; retrieved online at:
<https://humboldt.gov/1592/County-Parks-Facilities>

Humboldt County Office of Education. 2018. Humboldt County Schools and Districts; retrieved online at: <https://hcoe.org/schools/>

Humboldt Local Agency Formation Commission (LAFCO). 2008a. Loleta Fire Protection District Municipal Service Review, January. Retrieved online at:
<http://humboldtlafo.org/wp-content/uploads/Loleta-FPD-Adopted-MSR-January-2008.pdf>

Humboldt Local Agency Formation Commission. 2008b. Loleta Community Services District Municipal Service Review, September, retrieved online at:
<http://humboldtlafo.org/wp-content/uploads/Loleta-CSD-ADOPTED-MSR-September-2008.pdf>

Loleta Volunteer Fire Department. 2016. About Us; retrieved online at:
<http://pages.suddenlink.net/loletafire/>

3.13 Recreation

This section evaluates the potential impacts related to recreation during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The study area for this section is the same as the Project Area.

3.13.1 Setting

Physical Context

The study area is located within the 2,600 acre (1,052 hectares) Eel River Wildlife Area, and includes 805 acres (326 hectares) of land managed by the California Department of Fish and Wildlife (CDFW) as fish and wildlife habitat, and for public recreational uses.

The study area is generally bound by the Pacific Ocean to the west, Table Bluff to the north, McNulty Slough to the east, and North Bay to the south. It is currently accessible from an existing gravel road leading south from Table Bluff Road as well as the sand road commencing at the south end of the Humboldt Bay south spit. The north end of the gravel access road terminates into Table Bluff Road, a two-lane paved road maintained by the County of Humboldt. A locked gate currently restricts access to the gravel access road.

Existing Recreational Features

The study area is utilized for a range of recreational activities including fishing, wildlife viewing, bird-watching, hiking, boating, and seasonal hunting. There are no established trails within the study area, however recreational users can utilize opportunistic paths on the levees. Although access to the site is available year-round, visitation tends to be seasonal and aligned with established hunting seasons. The study area supports hunting of waterfowl, coots, and snipe. CDFW estimates that the study area attracts approximately 10 hunters per day during the hunting season, five days a week. The duck hunting season begins the third weekend in October and extends through the third weekend in January. The hunting season for coots is concurrent with the waterfowl hunting season, the hunting season for snipe begins October 20th and ends February 3rd, and the pheasant hunting season begins November 10th and ends December 23rd. Visitation for other recreation uses provided within the study area is estimated at 10 visitors per day (C. Barolotta, pers. comm. 2018).

Other public recreation facilities or access points in vicinity of the study area include Cock Robin Island, Crab Park, Cannibal Island Mad River Slough Wildlife Area, Fay Slough Wildlife Area, and the Humboldt Bay National Wildlife Refuge (Refuge)

(including the Salmon Creek, Hookton Slough, and Dunes Units). All of these recreational facilities allow recreational uses similar to the study area, including seasonal hunting. For purposes of comparison to visitation and recreation in other areas, the Refuge averages approximately 20,000 visitors per year for the entire complex, and approximately 12,825 visitors per year to the visitor center in Loleta alone.

3.13.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project related to recreational resources.

State

California Coastal Act

The study area is within the Coastal Zone. The California Coastal Act contains numerous policies relevant to recreation, as summarized below:

Public Resources Code Section 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 Section 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 Section 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 Section 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 Section 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 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.*
 - (6) Restoration purposes.*
 - (7) 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 Section 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.*

Local

Lands within the study area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential impacts related to recreation would be limited to the study area, local and regional regulatory policies are not included in this analysis.

3.13.3 Evaluation Criteria and Significance Thresholds

Under criteria provided in 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.

3.13.4 Methodology

The impact analysis included in this section is based on documented usage patterns, interviews, and other information collected from the County of Humboldt and CDFW.

3.13.5 Impacts and Mitigation Measures

Impact REC-1: Would the Project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

During construction of the Project, the existing recreational activities the site provides, such as fishing, hunting, bird watching, kayaking, boating, equestrian use, and hiking, would be temporarily unavailable to the public. The temporary closure of all or a portion of the study area would occur between the months of May and October over a two year period (likely 2021 and 2022) when the estuarine restoration component of the Project is implemented. Similarly, recreational access may be temporarily impacted (up to two weeks) in parts of the study area during invasive plant management activities, which would typically occur between August 1 and March 15. As discussed above, the duck hunting season begins the third

weekend in October and extends to the third weekend in January, with other hunting seasons ending as late as February. Although hunters may be displaced to another public facility open for hunting at the beginning of the season during the construction phase, it is not anticipated that other recreational facilities would be substantially deteriorated due to a slight increase in hunters for a short period of time (e.g., two weeks) over a limited number of construction seasons (two years). Under a worst case scenario, hunters would have to utilize another recreational facility for one full hunting season and a partial season the following year. However, as the season is confined to a few months a year and there are at least four other public facilities in the vicinity open to hunting, it is not likely that substantial physical deterioration of any hunting-related recreational facilities would occur during construction of the Project. Invasive plant management activities in hunted areas would be timed to avoid interfering with hunter access, and would have no impact on this recreational use.

Other recreational activities such as kayaking, bird watching, and hiking would also be temporarily displaced to adjacent parks or facilities during Project construction and/or invasive plant management activities. As noted above, this displacement is not anticipated to substantially deteriorate the other facilities due to the passive nature of the activities, the short-term nature of the anticipated use, and ability to disperse displaced uses to several proximate sites. A less than significant impact would occur during both the construction phase and during ongoing invasive plant management activities.

Once constructed, the study area would provide an improved parking area and access road, a formal non-motorized multi-use trail system, and a new non-motorized boat put-in, which would increase recreational opportunities in the study area and improve recreational facilities onsite. It is anticipated that the Project could result in up to 30 to 40 additional vehicles visiting the site per week compared to existing conditions, or four to six additional vehicles per day. This modest increase in use of the study area would be accommodated by the Project's improved parking area and multi-use trail system and the Project would not impact other recreational facilities in the vicinity.

By its nature, the Project would not directly or indirectly induce population growth. The Project does not create housing nor necessitate the development of housing. The Project would not result in the extension of utilities or roads or other infrastructure into outlying areas and would not directly or indirectly lead to the development of new sites that would induce population growth. Given the number of existing park and recreational options available in the Project vicinity and the fact that the Project would not induce population growth, the Project would not increase the use of parks such that substantial physical deterioration would occur. The impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact REC-2: Would the Project 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 proposed improvements to on-site recreational facilities, including an improved parking area and access road, a formal non-motorized multi-use trail system, and a new non-motorized boat put-in. The potential environmental impacts associated with installation of these elements are evaluated in the appropriate sections of this Draft EIR, including, but not limited to, Section 3.1 (Aesthetics), Section 3.3 (Air Quality), Section 3.4 (Biological Resources), and Section 3.9 (Hydrology and Water Quality).

Several of the proposed Project features would reduce the physical effect on the environment from visitors to the area. The existing parking area located at the north end of the access road would be gravelled to confine vehicular use within a prescribed area. The access road would be re-surfaced with asphalt concrete pavement, and the entryway would be monitored to ensure no visitors enter before sunrise and after sunset, limiting the hours of accessibility of the site. A path running parallel to the access road would be surfaced with gravel to direct foot traffic into the study area along a specific path. A new pervious concrete parking area would be established near the south end of the access road and would contain additional parking spaces, including an Americans with Disabilities Act (ADA)-accessible parking space and van pull out area. The proposed trails and associated bridge improvements would guide visitors through the area and protect sensitive habitats in the study area from unfettered access. The trails would also be ADA-accessible and would be constructed with pervious pavement. Additionally, the non-motorized boat put-in would provide a designated area to launch non-motorized boats, which would reduce deterioration, erosion, or other impacts to sensitive habitats, including wetlands, in the study area. The non-motorized boat put-in would also be ADA-accessible. For these reasons, the proposed recreational components of the Project would minimize adverse physical effects on the environment from on-going or increased recreational use.

The Project would not directly or indirectly induce population growth that would require the construction or expansion of recreational facilities beyond those included in the Project. As discussed in the Setting section, visitation to the study area and parks in the vicinity is fairly low. Visitation to areas distant from the Highway 101 corridor tends to be even lower. In light of the fact that a visit to the study area would require at least a half hour commitment of time by the average tourist, it is unlikely that visitation would increase measurably as a result of the Project.

Hunting, fishing, wildlife viewing, and general exploration serves as the primary draw to the study area. The study area would remain open to all of these uses after the Project is implemented. Hunters concerned about how potential Project-related changes in habitat types and bird use would impact hunting opportunities would also have access to other areas open to public hunting in the vicinity, including Cannibal Island, Mad River Slough Wildlife Area, Fay Slough Wildlife Area, and the Humboldt Bay National Wildlife Refuge.

Applicable state laws addressed above provide clear and consistent policy direction to provide, increase or enhance recreational and open space opportunities, with which the Project would be consistent.

The impact associated with provision of recreational facilities would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.13.6 Cumulative Impacts

Impact REC-C-1: Would the Project contribute to a cumulatively significant impact to recreational resources?

As discussed in Impact REC-1 and REC-2, the Project would have a less-than-significant impact on the environment relative to increased use or expansion of recreational facilities. Similar to the Project, implementation of cumulative projects identified in Table 3-1 (Projects Considered for Cumulative Impacts), such as the Salt River Ecosystem Restoration Project and the Eel River Estuary Preserve and Centerville Slough Enhancement, include recreational components, and may result in additional recreational use and on-going maintenance in the Project vicinity. Similar to the Project, the cumulative projects are predominantly restoration based, would not induce population growth, would not increase the use of parks such that substantial physical deterioration would occur, or require the expansion of recreational facilities. Therefore, the cumulative impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.13.7 References

Humboldt County. 1982. Eel River Area Plan of the Humboldt County Local Coastal Program.

Bartolotta, C. 2018. CDFW Wildlife Habitat Supervisor II Personal Communication between Cahill and Bartolotta, regarding recreational uses in the study area and vicinity. October 15.

3.14 Transportation

This section evaluates the potential impacts to transportation during construction, invasive plant management and maintenance of the proposed Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. Potential impacts on transportation from public access are also considered in this section. The study area for this section includes the Project Area and roadways that provide access to the Project Area from the nearest state highway (i.e., Table Bluff Road east to the intersection with Hookton Road, and Hookton Road east to U.S. Highway 101).

3.14.1 Setting

The following information discusses the transportation-related context in which the proposed Project would occur, including a description of the roadway network and public transit, pedestrian, and bicycle facilities in the Project vicinity.

Roadways

U.S. Highway 101 is the only State Highway that provides regional access to the Project vicinity. Hookton Road is an arterial rural two-lane roadway that diverges from U.S. Highway 101 and terminates at the intersection with Table Bluff Road. Table Bluff Road is a two-lane rural road that provides the only roadway access to the Project Area. Both Hookton and Table Bluff Road are county roadways that provide access to farms, residences, Table Bluff County Park and the South Jetty recreational area (South Jetty Road). The current intersection of Hookton Road and Table Bluff Road is an unsignalized, three-leg intersection with a stop-sign at northbound Table Bluff Road on to Hookton Road/Table Bluff Road. Hookton Road becomes Table Bluff Road west of this intersection.

The California Department of Transportation (Caltrans) measures the traffic volume for U.S. Highway 101 and reports the Annual Average Daily Traffic (Annual ADT) in a report issued by the Caltrans Traffic Census Program. The Annual ADT is the total traffic volume for the year divided by 365 days. The latest Annual ADT report issued by Caltrans was issued in 2016 (Caltrans 2016).

The 2016 Annual ADT reported for U.S. Highway 101 at Hookton Road ranged from 21,600 to 22,900. The 2016 Annual ADT for U.S. Highway 101 at Loleta Drive (approximately 2.3 miles [3.7 kilometers] south of Hookton Road) ranged from 22,800 to 22,900. The 2016 Annual ADT for U.S. Highway 101 at Fields Landing Overhead (approximately 2.4 miles [3.8 kilometers] north of Hookton Road) ranged from 21,600 to 24,800 (Caltrans 2016). According to the 2017 Humboldt County Association of Governments (HCAOG) Regional Transportation Plan, highways in

Humboldt County currently provide adequate facilities and level of service (HCAOG 2017).

Hookton Road and Table Bluff Road have a low volume of use. Traffic counts have not been collected, but would be expected to be low along Table Bluff Road within the Project vicinity, as the segment of Table Bluff Road adjacent to the Project Area terminates just north of the Project Area into South Jetty Road at the Table Bluff County Park. South Jetty Road terminates in a dead end at the northern extent of the South Jetty.

The nearest residential community to the Project Area is the 88-acre (36 hectares) Table Bluff Reservation. The Wiyot Table Bluff Reservation currently is home to over 100 residents. The Humboldt County General Plan Draft EIR, Section 3.5.1, states that 64.3 percent of Wiyot Table Bluff Reservation residents use cars alone for transportation, while 28.6 percent walk (Humboldt County 2017a).

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 2018). 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 (2.4 meters), with a 15 foot (4.7 meters) minimum width for a bi-directional path.

Class II “Bike Lane”: Within the roadway, a lane for preferential bicycle use, at least 4 feet (1.2 meters) wide or 5 feet (1.5 meters) 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.

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 or trails are presently located on or adjacent to the Project Area. Additionally, no pedestrian improvements, including sidewalks, are located at the Project Area or along local roadways in the Project vicinity. Neither Hookton Road or Table Bluff Road have demarcated bicycle lanes or fog line striping.

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 (RTS), as well as numerous small regional transportation systems, including: the Tish Non Village Transit, the

Willow Creek Transit Service, and the Southern Humboldt Local and Intercity Transit Systems. HTA also operates and maintains under contract 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 Area. There are no public transit connections located along Table Bluff Road or Hookton Road. The nearest public transit point of connection is the RTS/Tish Non Village bus stop (RTS Stop ID 1249) located at Scenic Drive and Loleta Drive in the town of Loleta. Additionally, the Humboldt County Regional Transportation Plan does not identify unmet transit needs that are reasonable to meet for the Project vicinity and does not include plans for future additional transit facilities within the Project vicinity (HCAOG 2017).

Airports

Of the nine public use airports in Humboldt County, the closest public airport to the Project Area is Samoa Field, located on the Samoa Peninsula approximately 6.5 aerial miles (10.5 kilometers) north-northeast from the northern boundary of the Project Area. The second closest airport is Rohnerville Airport, located south of the City of Fortuna, approximately 11 aerial miles (17.7 kilometers) southeast of the Project Area. The Project Area is not located within land use compatibility zones around Samoa Field or Rohnerville Airport. There are no private airfields in the Project vicinity.

3.14.2 Regulatory Framework

Federal

There are no federal regulations that apply to the proposed Project specific to transportation.

State

California Department of Transportation

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. Caltrans also requires a Transportation Management Plan for any traffic restrictions and detours that could affect the highway system. Transportation Management Plans must be prepared in accordance with the California Manual on Uniform Traffic Control Devices.

California Coastal Act

The California Coastal Act of 1976 (Coastal Act) set policies related to numerous natural resource categories, including transportation, and permanently established the California Coastal Commission (CCC). The CCC has the authority to plan and regulate resources within the Coastal Zone, including the use of land and water. The policies of the Coastal Act constitute the statutory standards applied to planning

and regulatory decisions made by the CCC and by local governments, pursuant to the Coastal Act (CCC 2018).

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Potential impacts within each resource category extending beyond the Project Area boundary, such as use of county roadways providing access to the Project Area, are analyzed utilizing local regulatory documents such as the Humboldt County General Plan and the Local Coastal Program Eel River Area Plan. Therefore local and regional regulatory policies are included in this analysis.

Humboldt County General Plan

The following goals from the Humboldt County General Plan (2017) are applicable to the Project with regard to transportation:

C-G1. Circulation System Safety and Functionality

A safe, efficient, accessible and convenient circulation system in and between cities, communities, neighborhoods, hamlets, and adjoining regions taking into consideration the context-specific needs of all users, consistent with urban, suburban, rural or remote community character.

C-G2. Diverse Transportation Opportunities

A transportation system that provides the availability of options among modes of travel by considering the needs of all users in a context sensitive manner that is appropriate to urban, suburban, rural or remote community character.

C-G4. Access to Active Transportation

Improved access to non-motorized modes of transportation, including walking, bicycling, horseback riding and hiking.

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 for Humboldt County, HCAOG adopts and submits an updated Regional Transportation Plan to the California Transportation Commission and Caltrans every five years. The HCAOG 20-Year Regional Transportation Plan is a long-range transportation planning document for Humboldt County. The most recent five-year update of the Regional Transportation Plan was adopted in 2017 (HCAOG 2017). The Regional Transportation Plan does not currently establish vehicular level of service criteria for county roadways in the Project vicinity.

Humboldt County Regional Bicycle Plan

The Humboldt Regional Bicycle Plan is a planning document that is updated every five years. The primary goal stated in the 2018 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 2018). Projects identified as priorities in the current Regional Bicycle Plan are anticipated to be implemented over a five-year period.

No bicycle facility projects are identified in the HCAOG 2018 Humboldt Regional Bicycle Plan for the Project Area, adjacent lands, or the arterial roadways accessing the Project Area. The nearest potential bicycle facilities projects identified in the 2018 Humboldt Regional Bicycle Plan are: Park Street (Loleta Drive to Franklin Avenue), Loleta Drive (Main Street to Franklin Avenue), and Franklin Avenue (Park Street to Loleta Drive) in Loleta (HCAOG 2018). The Park Street, Loleta Drive and Franklin Avenue segments are identified in the 2018 Humboldt Regional Bicycle Plan as potential future Class II bicycle routes.

3.14.3 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 program, plan, ordinance or policy addressing the circulation system, taking into account all modes of transportation including transit, roadway, bicycle, and pedestrian facilities;
- Conflict or be inconsistent with CEQA Guidelines Section 15064.3, subdivision (b);
- Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or
- Result in inadequate emergency access.

3.14.4 Methodology

As described above, the study area for this section is defined as the roadways that provide access to the Project Area from the nearest state highway, including Table Bluff Road from the Project Area east to the intersection with Hookton Road, and Hookton Road from Table Bluff Road intersection east to U.S. Highway 101.

This impact analysis evaluates the potential for the Project to conflict with State transportation regulations, as well as the County's adopted plans and applicable policies related to traffic 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.

3.14.5 Impacts and Mitigation Measures

Impact TR-1: **Would the Project conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?**

Construction

Construction of the Project would result in a short-term increase in construction-related vehicle trips on U.S. Highway 101, Hookton Road, and Table Bluff Road. Increased traffic would be associated with vehicle trips by construction workers and haul-truck trips for delivery of construction materials to the Project Area, as well truck trips associated with limited disposal of materials that may not be reused onsite (e.g., derelict tide gates). The number of construction-related vehicles traveling to and from the Project Area would vary on a daily basis; however, it is not expected that traffic control would be required because the number of construction worker vehicles accessing the Project Area on a daily basis would not exceed 20 and construction equipment would remain staged in the Project Area once it is mobilized. Moreover, all material appropriate for reuse on-site (i.e., soil) would remain within the Project Area, so truck trips to dispose of sediment offsite would not be required.

Construction vehicles and workers would utilize County highways and roadways to travel to the Project Area. 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, 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. The Project would not require encroachment onto a Caltrans or County right-of-way, nor the need for traffic restrictions or detours. 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.

There are no existing public transit routes, bicycle routes or pedestrian facilities located along the access routes to the Project Area, including Table Bluff Road or Hookton Road. The nearest public transit point of connection is the RTS bus stop located at Scenic Drive and Loleta Drive in Loleta. Project construction activities would, therefore, not impact the performance or safety of such routes or facilities. The construction phase of the Project would have a less-than-significant impact on transit, pedestrian and bicycle facilities.

Invasive Plant Management

Trips to the Project Area to conduct invasive plant management activities are anticipated to occur seasonally for up to ten years, or as long as needed to achieve control and/or eradication of targeted species. After the initial treatment of dense-

flowered cordgrass and European beachgrass in the Project Area, CDFW would remove regrowth of up to 10 acres of dense-flowered cordgrass and European beachgrass (for a total of 20 acres or more) per year, as needed. Vehicle trips to the Project Area would be necessary to carry out this work, however the trips would be limited to short periods of time and would not require traffic control.

Vehicle trips to support invasive plant management, in combination with vehicle trips for maintenance and public access activities, are expected to result in a total of up to 30 to 40 additional vehicles visiting the site per week compared to existing conditions. These activities would not require a change to the existing roadway network, would not change the configuration or capacity of any roadways or intersections, and would not affect existing speed limits. Therefore, the low to moderate increase in use of the Project Area for invasive plant management activities would not adversely affect access, infrastructure, or travel to/from the Project Area. Due to the seasonality and small number of anticipated trips to the Project Area to conduct invasive plant management activities, a less-than-significant impact on transit, pedestrian and bicycle facilities would occur.

Maintenance

Following Project implementation, relatively infrequent trips to the Project Area would take place for monitoring activities and maintenance and repair. Trips to carry out maintenance activities, in combination with invasive plant management and anticipated recreational uses, are expected to result in a total of up to 30-40 additional vehicle trips to the site per week compared to existing conditions. As noted above, these activities would not require a change to the existing roadway network, would not change the configuration or capacity of any roadways or intersections, and would not affect existing speed limits. Therefore, the low increase in use of the Project Area to carry out maintenance would not adversely affect access, infrastructure, or travel to/from the Project Area. Due to the small amount of anticipated trips, maintenance activities would have a less-than-significant impact on transit, pedestrian and bicycle facilities.

Public Access

The Circulation Element (Chapter 7) of the 2017 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 establishes a target level of service of C (LOS C) for County roadways in the Project vicinity (Humboldt County 2017).

Access to the Project Area would remain from Table Bluff Road via Hookton Road. It is anticipated certain recreational uses, such as hiking and bird watching, may increase under the Project due to improved public access and infrastructure (parking, trails, non-motorized boat put-in). Trips resulting from public access recreational uses, in combination with trips for invasive plant management and maintenance, are expected to result in up to 30 to 40 additional vehicles visiting the site per week compared to existing conditions. This increase in Project trips equates to approximately four to six additional vehicle trips per day. As noted above, additional recreational use of the Project Area by the public would not require

changes to the existing roadway network, would not change the configuration or capacity of any roadways or intersections, and would not affect existing speed limits. Therefore, the low to moderate increase in recreational use in the Project Area would not adversely affect access, infrastructure, or travel to/from the Project Area. Accordingly, the Project would not conflict with the goals outlined in Chapter 7.4 of the Humboldt County General Plan.

The Humboldt County Regional Transportation Plan (HCAOG 2017) does not include plans for additional public transportation facilities in the study area, and the Humboldt Regional Bicycle Plan (HCAOG 2018) does not include plans for bicycle improvements within the study area. Because the Project would not alter the configuration of Hookton Road or Table Bluff Road, it would not preclude the future establishment of public transit connections or bicycle routes in the area. Because only 30 to 40 additional vehicles per week may visit the Project Area after the Project is complete, the Project is not anticipated to result in increases to motor vehicle speeds or queuing of traffic onto Hookton Road, and would not substantially increase exposure of bicyclists and pedestrians to vehicle conflict areas.

The Project would not conflict with a program, plan, ordinance, or policy addressing the circulation system, therefore the impact of the Project on this evaluation criteria would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-2: Would the Project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Section 15064.3, subdivision (b), of the CEQA Guidelines lists the criteria for analyzing transportation impacts from proposed projects. The criteria are broken up into four categories, including land use projects, transportation projects, qualitative analysis, and methodology. The Project would restore and enhance saltmarsh and dune habitats within the Project Area, as well as provide additional recreational amenities. As the Project is not creating a new land use or altering roadways within the Project Area, the Project would not be considered a land use project, nor would it be considered a transportation project. Therefore, those criteria do not apply.

The qualitative analysis criterion states if there are no models or methods available to estimate the vehicle miles traveled (VMT), a qualitative analysis may be utilized, and that it may be appropriate to evaluate construction traffic as well as traffic associated with other activities, such as invasive plant management, maintenance and public access. Humboldt County does not have an applicable method or model to determine or evaluate the amount of VMT expected to occur from implementation of the Project, therefore, a qualitative analysis is deemed appropriate and included below.

During construction, the number of construction-related vehicles traveling to and from the Project Area would vary on a daily basis; however, it is not expected that traffic control would be required because the number of construction worker vehicles accessing the Project Area on a daily basis would not exceed 20, and construction equipment would remain staged in the Project Area once it is mobilized. Moreover,

all material appropriate for reuse on-site (i.e., soil) would remain within the Project Area, so truck trips to dispose of sediment offsite would not be required. Due to the limited duration of the construction phase and minimal number of trips anticipated to be needed to complete the Project, it is not anticipated the Project would generate a significant amount of VMT. A less than significant transportation impact would occur during the construction phase.

Following construction, it is anticipated that invasive plant management, maintenance and public access activities combined would result in approximately 30 to 40 additional vehicles visiting the Project Area per week compared to existing conditions. This increase in Project trips would equate to approximately four to six additional vehicles per day. Per the Technical Advisory on Evaluating Transportation Impacts in CEQA, projects generating fewer than 110 trips per day are generally assumed to cause a less-than-significant impact (OPR 2017). Therefore, the Project would have a less-than-significant impact regarding post-Project implementation VMT.

The final criterion, methodology, states that the lead agency has discretion to choose how to evaluate a project's VMT, as well the ability to adjust a model based on professional judgement as long as the adjustments are based on substantial evidence and any assumptions used are documented and explained. As Humboldt County has not developed a model or method to analyze VMT to date, CDFW has determined a qualitative approach is the preferred method of analysis. Therefore, the Project would not conflict with CEQA Guidelines Section 15064.3. A less-than-significant impact would occur.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-3 Would the Project substantially increase hazards due to geometric design features or incompatible use?

The Project would generate a temporary increase in traffic on local roadways related to the transport of materials and construction workers to and from the Project Area during a two-year construction period. 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 Area from Table Bluff Road via Hookton 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 30 to 40 additional vehicles that may visit the Project Area per week for recreation, invasive plant management or maintenance activities would not result in queuing of traffic onto Table Bluff Road, Hookton Road or other roadways. Therefore, the potential for Project construction, invasive plant management, maintenance activities or increased public access to increase hazards due to a geometric design feature or incompatible use would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

Impact TR-4: Would the Project result in inadequate emergency access?

Construction, invasive plant management, and maintenance of the Project would not require roadway closures or construction activities within the right-of-way of local roadways, including Hookton Road or Table Bluff Road. Implementation of the Project would not prevent emergency access to the Project Area or to adjacent land uses along Hookton Road or Table Bluff Road.

As described above, invasive plant management, maintenance and public access of the Project may result in 30 to 40 additional vehicles visiting the site per week compared to existing conditions. This increase in visitor trips to the Project Area equates to approximately four to six additional vehicles per day. Such a minimal increase in traffic along roadways would not substantially affect fire protection services or emergency response times to the Project Area or surrounding residences in the Project vicinity. The impact on emergency access would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.14.6 Cumulative Impacts**Impact TR-C-1: Would the Project contribute to a cumulatively significant impact 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.

As discussed in Impacts TR-1 through TR-4, Project construction, invasive plant management and maintenance activities as well as increased public access would have less-than-significant impacts related to conflicts with a program, plan, ordinance or policy addressing the circulation system (TR-1); conflicts with CEQA Guidelines Section 15064.3 subdivision (b) (TR-2); increased hazards due to design feature or incompatible uses (TR-3); or emergency access (TR-4).

Similar to the Project, implementation of the cumulative projects identified in Table 3-1 (Projects Considered for Cumulative Impacts) may result in construction traffic and low to moderate increases in recreational use and related vehicle trips. Construction of the Project may potentially overlap with cumulative projects that would be under construction or would be reasonably foreseeable in the Project vicinity. However, given the locations of the cumulative projects in relation to each other, local haul truck routes would likely utilize different roadways. Additionally, overlapping construction traffic and moderate increases in invasive plant management, maintenance and public access trips would not be expected to cause a significant cumulative impact relative to traffic congestion, because intersections and roadways in the area operate acceptably in general and overlapping construction would be temporary. None of the cumulative projects would affect on-site circulation and queuing of cars at the Project Area, increase hazards due to design feature or incompatible uses, or impact bicycle and pedestrian trips in or around the Project Area. Therefore, cumulative impacts relative to transportation and circulation would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.14.7 References

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3.15 Tribal Cultural Resources

This section evaluates potential impacts related to tribal cultural resources during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. Tribal cultural resources include resources that are of specific concern to California Native American tribes, with knowledge of such resources limited to tribal people. Refer to Section 3.5 (Cultural Resources) for a discussion of prehistoric or historic archaeological sites, structures, or objects, and to Section 3.6 (Geology and Soils) for a discussion of paleontological resources. The study area for this section is the same as the Project Area.

3.15.1 Setting

Native American Contact

Formal consultation for this Project was initiated between the lead agency (CDFW) and California Native American tribes culturally affiliated with the study area on July 26, 2018, pursuant to CEQA and Public Resources Code (PRC) Section 21080.3.1, as well as CDFW's Tribal Communication and Consultation Policy. Letters were sent to representatives of the Bear River Band of Rohnerville Rancheria, the Big Lagoon Rancheria, the Blue Lake Rancheria, the Cher-Ae Heights Indian Community of the Trinidad Rancheria, the Hoopa Valley Tribe, the Round Valley Reservation/Covelo Indian Community, and the Wiyot Tribe. A response was received from the Cher-Ae Heights Indian Community of the Trinidad Rancheria on August 23, 2018 stating that the study area is outside the geographical area of concern for the Trinidad Rancheria. No other responses have been received to date, and no Tribes requested formal consultation for the Project.

On October 26, 2017, Origer & Associates contacted the Native American Heritage Commission (NAHC), requesting information on any known sacred lands or other cultural sites that may be present within the study area (Origer & Associates 2017). No response from the NAHC has been received to date.

3.15.2 Regulatory Framework

State

California Public Resources Code Section 21074

California PRC Section 21074 details what can be considered a tribal cultural resource.

- a) *Tribal cultural resources are either of the following:*

- 1) *Sites, features, places, cultural landscapes, sacred places and objects with cultural value to a California Native American tribe that are either of the following:*
 - a. *Included or determined to be eligible for inclusion in the California Register of Historical Resources (CRHR).*
 - b. *Included in a local register of historical resources as defined in subdivision (k) of PRC Section 5020.1.*
- 2) *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1. In applying the criteria set forth in subdivision (c) of PRC Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe.*
 - b) *A cultural landscape that meets the criteria of subdivision (a) is a tribal cultural resource to the extent that the landscape is geographically defined in terms of the size and scope of the landscape.*
 - c) *A historical resource described in PRC Section 21084.1, a unique archaeological resource as defined in subdivision (g) of PRC Section 21083.2, or a “nonunique archeological resource” as defined in subdivision (h) of PRC Section 21083.2 may also be a tribal cultural resource if it conforms with the criteria of subdivision (a).*

California Public Resources Code Section 21084.1

A project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment. For purposes of this section, an historical resource is a resource listed in, or determined to be eligible for listing in, the CRHR. Historical resources included in a local register of historical resources, as defined in subdivision (k) of PRC Section 5020.1, or deemed significant pursuant to criteria set forth in subdivision (g) of PRC Section 5024.1, are presumed to be historically or culturally significant for the purposes of this section, unless the preponderance of the evidence demonstrates that the resource is not historically or culturally significant. The fact that a resource is not listed in, or determined to be eligible for listing in, the CRHR, not included in a local register of historical resources, or not deemed significant pursuant to criteria set forth in subdivision (g) of PRC Section 5024.1 shall not preclude a lead agency from determining whether the resource may be an historical resource for purposes of this section.

Assembly Bill 52

Assembly Bill 52 (AB 52), the Native American Historic Resource Protection Act, sets forth a proactive approach intended to reduce the potential for delay and conflicts between Native American and development interests. Projects subject to AB 52 are those that file a notice of preparation for an Environmental Impact Report or notice of intent to adopt a negative or mitigated negative declaration on or after July 1, 2016. AB 52 adds tribal cultural resources to the specific cultural resources protected under CEQA. Under AB 52, a tribal cultural resource is defined as a site,

feature, place, cultural landscape (must be geographically defined in terms of size and scope), sacred place, or object with cultural value to a California Native American tribe that is either included or eligible for inclusion in the CRHR, or included in a local register of historical resources. A Native American Tribe or the lead agency, supported by substantial evidence, may choose at its discretion to treat a resource as a tribal cultural resource. AB 52 also mandates lead agencies consult with tribes, if requested by the tribe, and sets the principles for conducting and concluding consultation.

California Register of Historical Resources

The CRHR is a listing of all properties considered to be significant historical resources in the state. These include all properties listed or determined eligible for listing on the National Register of Historical Places (NRHP), including properties evaluated under Section 106 of the National Historic Preservation Act, and State Historical Landmarks. The criteria for listing are the same as those of the NRHP. The CRHR statute specifically provides that historical resources listed or determined eligible for listing on the CRHR by the State Historical Resources Commission, or resources that meet the CRHR criteria are resources which must be given consideration under CEQA.

Resources eligible for listing include buildings, sites, structures, objects or historic districts that retain historic integrity and are historically significant at the local, state or national level under one or more of the following criteria:

- Criterion 1. Associated with events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States;
- Criterion 2. Associated with the lives of persons important to local, California or national history;
- Criterion 3. Embodies the distinctive characteristics of a type, period, region or method of construction or represents the work of a master or possesses high artistic values; or
- Criterion 4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Resources must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. A resource that has lost its historic character or appearance may still have sufficient integrity for the CRHR, if, under Criterion 4, it maintains the potential to yield significant scientific or historical information or specific data.

California Environmental Quality Act

CEQA requires lead agencies to determine if a project would have a significant effect on tribal cultural resources. The CEQA Guidelines define a tribal cultural resource according to California PRC Section 21074.

While some tribal cultural resources include physical archaeological resources, described above, cultural resources are not limited to physical resources that have scientific significance. Tribal cultural resources also include cultural landscapes and

non-unique archaeological resources. Non-unique resources are resources that are deemed culturally significant to a tribe, but do not contain information needed for scientific purposes, and may not be the best specimen in terms of quality, uniqueness, or age.

California Coastal Act

The study area is within the Coastal Zone. The California Coastal Act (Coastal Act) contains policies relevant to cultural resources, 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 relevant to this analysis:

Public Resources Code Section 30116 Sensitive coastal resource areas

“Sensitive coastal resource areas” means those identifiable and geographically bounded lands and water areas within the coastal zone of vital interest and sensitivity. “Sensitive coastal resource areas” include the following:

(d) Archaeological sites referenced in the California Coastline and Recreation Plan or as designated by the State Historic Preservation Officer.

Public Resources Code Section 30244 Archaeological or paleontological resources

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

Public Resources Code Section 30107.3 Environmental Justice

“Environmental justice” means the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.

Regional and Local

Lands within the study area are owned by CDFW or are under the jurisdiction of the State Lands Commission and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential Project impacts related to tribal cultural resources would be limited to the study area, local and regional regulatory policies are not included in this analysis.

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 a tribal cultural resource if it would cause a substantial adverse change in the significance of a tribal cultural resource (as defined in PRC Section 21074) that is:

- A resource listed or eligible for listing in the CRHR, or in a local register of historical resources as defined in PRC Section 5020.1(k); or

- A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of PRC Section 5024.1.

3.15.4 Methodology

The evaluation of potential impacts on tribal cultural resources is based on the potential for ground disturbance during construction, invasive plant management or maintenance activities to disturb or destroy known or previously unrecorded tribal cultural resources. The impact analysis included in this section is based on the Historic Resources Study prepared for the Project by Origer & Associates (2017), and consultations with California Native American tribes traditionally and culturally affiliated with the geographic area of the Project.

3.15.5 Impacts and Mitigation Measures

Impact TCR-1: Would the Project cause a substantial adverse change in the significance of a tribal cultural resource listed or eligible for listing in the California Register of Historical Resources, or determined by the lead agency to be significant pursuant to subdivision (c) of the Public Resources Code section 5024.1?

As described above, in July 2018, CDFW requested in writing feedback on the Project from California Native American tribes culturally affiliated with the study area, pursuant to CEQA and PRC Section 21080.3.1. Letters were sent to ten individuals representing seven Native American tribes. The letters included a thorough description of the Project, and invited tribes to provide information or concerns with regards to tribal or other cultural resources within the study area. A response was received from the Cher-Ae Heights Indian Community of the Trinidad Rancheria on August 23, 2018 stating that the study area is outside the geographical area of concern for the Trinidad Rancheria. No other responses have been received to date, and no tribes requested formal consultation for the Project.

As described in Chapter 3.5 (Cultural Resources), an Historical Resources Study was prepared for the Project (Origer & Associates 2017). The study included a records and literature search at the Northwest Information Center (NWIC) of the California Historical Resources Information System; communication with the NAHC to request a review of the Sacred Lands File; additional contact with appropriate local Native American tribes; and a pedestrian archaeological survey of the study area.

The records and literature search identified one recorded cultural resource of potential importance to Native American tribes within the study area. The recorded site, referred to as the Welapl site (P-12-000170), is a Wiyot archaeological site discovered by Loud in 1918. There is little information about this site in Loud (1918), but it is likely it was used as a dwelling place by Wiyot people before the turn-of-the-century (Origer & Associates 2017). During an archaeological field reconnaissance survey of the study area, the areas in which the Welapl site (P-12-000170) were plotted by the NWIC and Loud (1918) were inspected, but no archaeological evidence was found of this archaeological site.

The CRHR eligibility criterion, listed in Subsection 3.15.2, is utilized when determining potential significance of tribal cultural resources. The Welapl site is not considered significant under Criterion 1 because there is nothing to suggest that it is associated with any events that have made a significant contribution to regional or local history or the cultural heritage of California or the United States. The site is not significant under Criterion 2 because there is nothing to suggest that the location is associated with the lives of persons important to local, California or national history. The site is not significant under Criterion 3 because it has no distinctive characteristics, rather it is only described as “neither occupied nor named by recent Wiyot.” However, the site could be significant under Criterion 4, although no evidence of the archaeological site was found during the cultural resources survey (Origer & Associates 2017).

The Project includes invasive plant management activities in the areas in which the Welapl site were plotted by the NWIC and Loud. As noted above, an archaeological field reconnaissance survey of the plotted areas did not identify archaeological evidence for the site. However, if the archaeological site is encountered during Project activities, a significant impact could occur.

In addition, it is possible that additional unrecognized surficial resources or subsurface archaeological deposits are present within the study area. If as-of-yet unknown tribal cultural resources are encountered during construction, invasive plant management or maintenance activities, a significant impact could occur.

Mitigation Measures: Implement Mitigation Measures TCR-1, and CR-1 and CR-2.

Mitigation Measure TCR-1: Protect Unknown Tribal Cultural Resources

If potential tribal cultural resources are uncovered during construction, the Project contractor shall halt work within 100 feet (30 meters) of the discovery, and CDFW shall be immediately notified. Should any tribal cultural resources be discovered during construction on lands under the jurisdiction of SLC, CDFW shall consult with SLC. Workers shall avoid altering the materials and their context, and shall not collect cultural materials. CDFW shall notify California Native American tribes culturally affiliated with the study area. If, after coordination with the Tribe(s), a qualified archaeologist, and the SLC, CDFW determines that the find potentially qualifies as a tribal cultural resource for purposes of CEQA (per CEQA Statute 21084.3), all work must remain stopped in the immediate vicinity to allow evaluation of any materials and recommendation of appropriate treatment. Avoidance of impacts to the tribal cultural resource is preferable. In considering any suggested measures to mitigate impacts to tribal cultural resources, CDFW shall determine whether avoidance is feasible in light of factors such as the nature of the find, Project design, and other considerations. If avoidance is infeasible, other appropriate measures as recommended by the Tribe (i.e., preservation in place; reburial onsite; moved to an appropriate location) shall be instituted. Work may proceed on other parts of the Project while mitigation for tribal cultural resources is being carried out. The final disposition of tribal cultural resources recovered

on state lands under the jurisdiction of SLC must be approved by the Commission.

Mitigation Measure CR-1: Environmental Awareness Training

Prior to the initiation of any construction work, an archaeologist who meets the U.S. Secretary of Interior's professional standards shall conduct environmental awareness training for construction crews and other relevant Project personnel. At a minimum, the training will cover the kinds of cultural materials that may be present in the Project Area and the protocols to be followed should any such materials be uncovered during construction. Training shall be required at the onset of each year of construction and maintenance activities to educate new construction personnel.

Prehistoric archaeological site indicators include: obsidian and chert flakes and chipped stone tools; grinding and mashing implements (e.g., slabs and handstones, and mortars and pestles); bedrock outcrops and boulders with mortar cups; and locally darkened midden soils. Midden soils may contain a combination of any of the previously listed items with the possible addition of bone and shell remains, and fire affected stones. Historic period site indicators generally include: fragments of glass, ceramic, and metal objects; milled and split lumber; and structure and feature remains such as building foundations and discrete trash deposits (e.g., wells, privy pits, dumps).

Mitigation Measure CR-2: Protection of the Welapl Site

Prior to initial ground disturbing work in the vicinity of the Welapl site, an archaeologist who meets the U.S. Secretary of Interior's professional standards shall re-survey the area for the presence of surficial cultural resource deposits. The archaeologist shall also excavate 4-5 auger borings in the vicinity of the site to assess subsurface conditions.

If historical or archaeological resources are found in the vicinity of the site, CDFW shall implement measures to protect the integrity of the resource and ensure that no additional resources are impacted, as provided in Mitigation Measure CR-4. If no historical or archaeological resources are identified during the surface inspection or subsurface exploration, Project activities may commence without monitoring by an archaeologist.

Subsequent invasive plant management activities in the vicinity of the Welapl site would not be subject to the surface and subsurface assessment requirements provided above, unless otherwise required by CDFW and/or SHPO in accordance with Mitigation Measure CR-4.

Level of Significance: Less than significant after mitigation.

Implementation of Mitigation Measures TCR-1, CR-1, and CR-2 would reduce potentially significant impacts on tribal cultural resources to a less-than-significant level by providing environmental awareness training for construction personnel, archaeological surveys, a process for evaluation of any resources encountered during construction, and avoidance or data recovery measures consistent with appropriate laws and requirements.

3.15.6 Cumulative Impacts

Impact TCR-C-1: Would the Project contribute to a cumulatively significant impact to Tribal Cultural Resources?

Implementation of the cumulative projects listed in Table 3-1 (Projects Considered for Cumulative Impacts) may require grading and excavation that could potentially affect tribal cultural resources. If these resources are not protected, the cumulative effect of the Project plus cumulative projects could be significant. CEQA requirements for protecting tribal cultural resources would be applicable to each of the cumulative projects. As discussed in this section, record searches and research were undertaken to ensure that tribal cultural resources that could be impacted were identified. Mitigation Measures TCR-1, CR-1 and CR-2 would reduce impacts to a less-than-significant level. With implementation of the mitigation measures, the Project's contribution to this cumulative impact would not be cumulatively considerable, and therefore less than significant.

Mitigation Measures: No additional mitigation is necessary.

Level of Significance: Less than significant.

3.15.7 References

Origer and Associates. 2017. Historical Resources Study for the Ocean Ranch Estuary Restoration Project Humboldt County, California, prepared for Ducks Unlimited (DU Project No. US-CA-398-4), December.

3.16 Energy

This section evaluates the potential impacts of the Project related to energy consumption during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The study area for this resource section is the same as the Project Area.

3.16.1 Setting

Energy Resources

Energy resources in Humboldt County consist primarily of fossil fuels such as natural gas deposits. Active gas wells in Humboldt County are concentrated in the Tompkins Hill Gas Field in the Eel River basin. Although natural gas deposits exist in Humboldt County, the County imports approximately 90 percent of its natural gas. There is no record of geothermal production in Humboldt County. The study area is not located on or near any substantial known energy source or energy system infrastructure.

Roughly half of the electricity serving Humboldt County is generated at the Pacific Gas and Electric Company (PG&E) Humboldt Bay Generation Station utilizing a 163-megawatt natural gas-fired power plant. Local biomass resources are used to provide about 25 to 30 percent of the county's electricity needs. The biomass resources are primarily derived from lumber mill wood residue. It is projected that local renewable resources could provide the majority of Humboldt County's electricity needs and a substantial portion of heating and transportation energy demands (Humboldt County 2017). No existing energy infrastructure serves the study area.

3.16.2 Regulatory Framework

This section presents applicable regulations and policies to the extent that they may apply to Project construction, invasive plant management, and maintenance activities. Federal regulations, such as the Corporate Average Fuel Efficiency Standards, and state regulations, such as the California Green Building Standards and California Energy Efficiency Standards for Residential and Non-residential Buildings, are not included in this section as the Project does not involve components that would be subject to such regulations.

Federal

There are no energy-related federal regulations that apply to the Project.

State

State of California Energy Action Plan

In 2003, the three key energy agencies in California—the California Energy Commission (CEC), the California Power Authority (CPA), and the California Public Utilities Commission (CPUC)—jointly adopted an Energy Action Plan (EAP) which sets goals for California’s energy future and memorializes a commitment to achieve these goals through specific actions. In 2005, the CPUC and the CEC jointly prepared a subsequent draft of the EAP (EAP II) to identify further actions necessary to meet California’s future energy needs. To the extent that efficiency, demand response, renewable resources, and distributed generation are unable to satisfy increasing energy and capacity needs, the EAP II supports the use of clean and efficient fossil-fuel energy generation. The plan recognizes that concurrent improvements are required to the bulk electricity transmission grid and distribution facility infrastructure to support growing demand centers and the interconnection of new generation, both on the utility and customer side of the meter.

Senate Bill 1389

Senate Bill (SB) 1389, the *California Integrated Energy Policy*, was adopted in August 2002 and requires the CEC to prepare an Integrated Energy Policy Report (IEPR) for electricity, natural gas, and transportation fuels. The IEPR contains an analysis of the policies and actions that are necessary to ensure that the state has adequate energy resources—including a range of alternative energy resources—to meet its needs. The IEPR also includes recommendations to reduce energy demand and to improve the state’s energy infrastructure.

Assembly Bill 1007

Assembly Bill 1007 (Pavley, Chapter 371, Statutes of 2005) required the CEC to prepare a state plan to increase the use of alternative fuels in California (State Alternative Fuels Plan). The CEC prepared the State Alternative Fuels Plan in partnership with the California Air Resources Board and in consultation with other state, federal, and local agencies. The final State Alternative Fuels Plan, published in December 2007, attempts to achieve an 80-percent reduction in greenhouse gas emissions associated with personal transportation, even as California’s population increases.

Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. Because potential impacts related to energy would be limited to the immediate Project Area, local and regional regulatory policies are not included in this analysis.

3.16.3 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 energy resources if it would result in any of the following:

- Result in potentially significant environmental impact due to wasteful, inefficient; unnecessary consumption of energy resources, during Project construction or operation; or
- Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

The following sections describe the anticipated environmental impacts on energy due to the Project.

Areas of No Project Impact

Construction, invasive plant management activities and maintenance of the Project would not result in short-term, long-term or cumulative impacts relative to one of the evaluation criteria identified for energy resources. For the reasons presented below, the following evaluation criterion is not applicable to the Project.

- **Would the Project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?** Lands within the study area are owned by CDFW or are under the jurisdiction of the State Lands Commission and therefore are not subject to any local plans or regulations governing energy resources. The Project would not conflict with or inhibit the implementation of the State EAP or other state regulations that are applicable to the Project. No residential or non-residential building development is proposed so green building codes and building-related energy reduction goals are not applicable. The Project would require the use of equipment to construct the Project and remove invasive plant species; however, these activities would be temporary and would not interfere with the broader renewable energy or energy efficiency goals of the state. This criterion is not applicable to the Project and will not be discussed further.

3.16.4 Methodology

Existing information sources were reviewed to determine whether any portions of the study area contain significant energy resources and to evaluate how these resources, if any, would be affected by the Project. This analysis evaluates the use of energy resources (e.g., fuel and electricity) during the construction, invasive plant management activities, and maintenance of the Project. Specifically, the analysis considers whether Project activities would use large amounts of fuels or energy, and whether they would be used in a wasteful manner.

3.16.5 Impacts and Mitigation Measures

Impact: EN-1: Would the Project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during Project construction or operation?

Construction

Construction of the estuarine restoration portion of the Project would require use of heavy equipment, as discussed in Section 3.3 (Air Quality), and associated fuels

(primarily gas, diesel, and motor oil). The precise amount of construction-related energy consumption that would occur 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. Trips expected to occur during Project construction would consist of less than 30 per day, and construction equipment would remain staged in the Project Area once mobilized. Additionally, all material appropriate for reuse on-site would remain within the Project Area so truck trips to dispose of sediment off-site would not be required. The use of fuel would be limited to construction activities of the estuarine restoration component of the Project and would not be wasteful or unnecessary.

Excessive idling and other inefficient site operations would be prohibited. 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]). Because of the relatively short initial timeframe needed to construct the estuarine restoration portion of the Project (approximately two construction seasons), and because Project construction would not encourage activities that would result in the use of large amounts of fuel and energy in a wasteful manner, impacts related to the inefficient use of construction-related fuels would be less than significant.

Invasive Plant Management and Maintenance

Following Project implementation, periodic maintenance of infrastructure by CDFW staff, including road, parking area, and trail maintenance, as well as ongoing management of non-native plants in the estuarine restoration area and along the dunes may be conducted. These activities would generally be supported by CDFW vehicles and use of hand-held tools, although some activities (e.g., mechanical removal of dense-flowered cordgrass or European beachgrass) may require use of heavy equipment. Passive recreational uses of the site, such as hiking, wildlife viewing, and small watercraft use would also continue to occur, and would require use of personal vehicles to access the site. The use of fossil-fuel powered equipment to support invasive plant management and maintenance activities would be periodic and short-term (e.g., European beachgrass removal would occur intermittently between August 1 and March 15 for a period of six years, and potentially up to ten years or as long as needed to achieve control and/or eradication). These activities would not result in a substantial increase in energy use, and would not result in inefficient, wasteful, or unnecessary consumption of fuels or other energy resources. The impact would be less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.16.6 Cumulative Impacts

Impact EN-C-1: Would the Project contribute to a cumulatively significant impact to energy resources?

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).

As described in Impact EN-1, the Project would have a less-than-significant impact relative to inefficient, wasteful, or unnecessary consumption of fuels or other energy resources. Construction of the cumulative projects identified in Table 3-1 (Projects Considered for Cumulative Impacts) would also require the consumption of fuels and other energy resources. However, each of the cumulative projects would be required to comply with existing and future laws and regulations governing energy use, similar to the Project. The cumulative project impacts would also include predominantly passive recreation and restoration related uses, and would not result in a substantial increase in energy use. For this reason, the cumulative impact from energy use would be less than significant.

Mitigation Measures: No mitigation necessary.

Level of Significance Less than significant.

3.13.7 References

California Environmental Protection Agency (Cal EPA). 2006. Climate Action Team Report to Governor Schwarzenegger and the Legislature. March.

Humboldt County. 2017. Humboldt County General Plan, October. Available at: <https://humboldt.gov/205/General-Plan>.

3.17 Wildfire

This section evaluates the potential impacts of the Project related to wildfire during construction, invasive plant management, and maintenance of the Project. Construction activities include the earthwork involved in the estuarine restoration and infrastructure improvement portions of the Project. Invasive plant management activities include the removal of dense-flowered cordgrass (*Spartina densiflora*), European beachgrass (*Ammophila arenaria*), and dwarf eelgrass (*Zostera japonica*) using any one or a combination of the methods described in Section 2.5 (Proposed Invasive Plant Management). Maintenance activities include periodic repairs and improvements to the non-motorized boat put-in, trails, parking lots and road within the Project Area, and also include monitoring activities. The study area for this section includes the Project Area and adjoining properties that could potentially be impacted should a wildfire occur within the Project Area.

3.17.1 Setting

Wildfire

A wildfire is a non-structural fire that occurs in vegetative fuels, excluding prescribed or controlled fire. Wildfires can occur in undeveloped areas and spread to urban areas where the landscape and structures are not designed to be fire resistant. A wildland-urban interface is an area where development is located in proximity to areas prone to wildfire. More specifically, the National Fire Protection Agency states that the wildland-urban interface exists when certain conditions are present, including but not limited to, the amount, type, and distribution of vegetation; the flammability of structures in the area, and their proximity to fire-prone vegetation and other combustible structures; weather patterns and general climate conditions; topography; hydrology; and average lot size (NFPA 2009).

Vegetation is the main source of fuel for wildfires. Therefore, areas near open vegetated spaces have an increased wildfire risk. Weather conditions such as wind, temperature, and humidity are all factors generally used to predict fire behavior. Wind increases flammability of fuels by removing moisture through evaporation. During a wildfire, wind can also carry embers, increasing the fire's range. Higher temperatures and low humidity are indicative of higher fire risk, increasing flammability of vegetation. Topographic features such as slope, as well as the overall form of the land, effects fire behavior, including its intensity, direction, and rate of spread. Fires in flat or gently sloping areas tend to burn slower. Existing hydrology can also have an impact, as streams and rivers tend to channel winds, which can accelerate the fire's speed and direction. The presence of large hydrological features tends to increase humidity and can make it more resistant to the effects of fire (Humboldt County 2019).

The California Department of Forestry and Fire Protection (CAL FIRE) maps areas of significant fire hazard throughout the state of California. The fire hazard areas are divided into different levels of Fire Hazard Severity Zones (FHSZ). The zones are based on a hazard scoring system that reflect several criteria, such as availability of fuels, historical data, terrain, proximity to urbanized areas, and weather. Each of the fire hazard areas are categorized into areas of moderate, high, or very high fire

hazard zones. These maps include both areas protected by CAL FIRE as well as areas protected by local entities. Lands that are protected by CAL FIRE are classified as State Responsibility Areas (SRA). Alternatively, lands that are protected by a local entity are classified as a Local Responsibility Area (LRA).

The Project Area is located within the service area of the Loleta Fire Protection District (see Figure 3.17-1). However, it is located immediately adjacent to both a moderate and high fire hazard SRA. The areas adjacent to the Project Area are located within the service boundaries of the CAL FIRE and the Loleta Fire Protection District. The primary fire hazard severity zone applied to the study area is LRA Unzoned, with segments of the north and central portions of the study area designated as LRA Moderate (CAL FIRE 2007b).

Wildfire Occurrences

Between 2012 and 2017, 12 wildfires occurred within the south spit (the area spanning the southern mouth of Humboldt Bay to the northern mouth of Eel River). One of these fires was located within the proposed dune restoration area, which encompasses a portion of the south spit. This fire grew rapidly due to the flammability of European beachgrass. This wildfire produced flames up to 12-feet (3.6 meters) high, and ultimately burned 33 acres (13 hectares) of the Project Area (R. McLaughlin pers. comm. 2019).

Existing Conditions

The Project Area is generally undeveloped and heavily vegetated with a mix of invasive and native plant species typically found in marsh and dune habitats (Refer to Section 3.4 for a more comprehensive discussion of the existing biological conditions). Development in the vicinity of the Project Area is typical of agriculture, consisting of barns and residences spaced far apart to provide room for agricultural fields and pasture. The only structure located within the Project Area is an abandoned barn. The nearest cluster of structures outside of the Project Area, but in the study area, is located approximately 350 feet (107 meters) east of the Project Area, with the next closest structures being several thousand feet away. Topography in the study area is generally flat, though the area gradually slopes upward to the north and east, at the foot of Table Bluff.

3.17.2 Regulatory Framework

Federal

There are no federal regulations that apply to the Project related to wildfire risks.

State

California Department of Forestry and Fire Protection

CAL FIRE protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed values providing social, economic, and environmental benefits to rural and urban citizens. As of June 17, 2020, CAL FIRE has responded to 2,767 wildfire incidents in 2020, which burned 15,163 acres (6,136 hectares) (CAL FIRE 2020). In 2019 CAL FIRE responded to 7,860 wildfire incidents, which burned a total of 259,823 acres (105,147 hectares);

in 2018 CAL FIRE responded to 7,639 wildfire incidents which burned a total of 1,963,101 acres (794,439 hectares); and in 2017, CAL FIRE responded to 9,270 wildfire incidents, which burned a total of 1,548,429 acres (626,630 hectares) (CAL FIRE 2020).

The Office of the State Fire Marshal supports CAL FIRE's mission by focusing on fire prevention. It provides support through a wide variety of fire safety responsibilities including regulating buildings in which people live, congregate, or are confined; controlling substances and products which may, in and of themselves, or by their misuse, cause injuries, death, and destruction by fire; providing statewide direction for fire prevention in wildland areas; regulating hazardous liquid pipelines; reviewing regulations and building standards; and providing training and education in fire protection methods and responsibilities.

State of California Emergency Response Plan

California has developed the State of California Emergency Response Plan to coordinate emergency services provided by federal, state, and local government agencies. The plan is administered by the State Office of Emergency Services, which coordinates the responses of other agencies such as local fire and police agencies, emergency medical providers, California Highway Patrol, CDFW and Caltrans (California 2019).

California Public Resources Code

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).
- 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 must 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).

CAL FIRE also provides oversight for all prescribed burns in the study area and would assist with prescribed burns of non-native plants under the invasive plant management phase of the Project.

Regional and Local

Lands within the Project Area are owned by CDFW or are under the jurisdiction of the State Lands Commission, and therefore will not require a Conditional Use Permit from Humboldt County nor adherence to the Humboldt County General Plan or the Local Coastal Program Eel River Area Plan. The portions of the study area that extend beyond the Project Area boundary, including adjacent properties, would be subject to local regulation, including the following Humboldt County plans.

Humboldt County Operational Area Hazard Mitigation Plan

The 2014 Humboldt County Operational Area Hazard Mitigation Plan Update is the county's plan to identify and reduce hazards before any type of hazard event occurs (Humboldt County 2014). The Hazard Mitigation Plan aims to reduce losses from future disasters such as dam failure, drought, earthquake, fish losses, flooding, landslide, severe weather, tsunami, and wildfire. The Hazard Mitigation Plan also includes a vulnerability analysis and proposed initiatives designed to minimize future hazard-related damage. The plan mentions several actions that could reduce or mitigate wildfire risk, including clearing fuels on property, creating and implementing fire plans, and identifying evacuation routes.

Humboldt County Emergency Operations Plan

The 2015 Humboldt County Emergency Operations Plan (EOP) for the Humboldt Operation Area addresses the planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Humboldt County (Humboldt County 2015). The Federal Emergency Management Agency approved the Humboldt Operational Area Hazard Mitigation Plan on March 20, 2014. The EOP 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 activities, and the recovery process.

Humboldt County General Plan Goals and Policies

The following policy from the Humboldt County General Plan is relevant to the proposed Project:

- **S-P23:** Hazardous Fuel Reduction. Encourage land management activities that result in the reduction of hazardous fuels and also support timber management, livestock production, and the enhancement of wildlife habitat, through the use of prescribed burning, hand or mechanical methods, firewise plants, biomass utilization, and animal grazing.

3.17.3 Evaluation Criteria and Significance Thresholds

Under criteria based on Appendix G of the CEQA Guidelines, the Project would result in a significant impact if it was located in or near an SRA or lands classified as very high fire hazard severity zones, and would result in any of the following:

- Substantially impair an adopted emergency response plan or emergency evacuation plan;

- Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire;
- Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in the temporary or ongoing impacts to the environment; or
- Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire instability, or drainage changes.

The following sections describe the anticipated environmental impacts due to wildfire risks from the Project.

Areas of No Project Impact

As explained below, the Project would not result in impacts related to three 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 substantially impair an adopted emergency response plan or emergency evacuation plan?** The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. The Project Area is undeveloped, with the exception of unpaved roads. A vacant wooden barn and associated remnant corrals exist immediately adjacent to the Project Area. The Project Area is uninhabited, and the Project does not propose to construct habitable structures. The Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan should a wildfire occur within or in the vicinity of the study area. In fact, the proposed road improvement, and parking area and trail establishment could aid in emergency response access to and evacuation from the Project Area. There are no designated evacuation routes within the vicinity of the Project Area. Therefore, no impact would occur and this significance criterion is not discussed further in this Draft EIR. Please refer to Section 3.8.3 of the Draft EIR for further discussion of emergency response adequacy.
- **Would the Project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or may result in temporary or ongoing impacts to the environment?** The Project would improve an existing unpaved road and parking area by resurfacing the road with asphalt concrete pavement and the existing parking area with gravel. A new pervious concrete parking area would be established near the south end of the access road, and would include an American with Disabilities Act (ADA)-accessible parking space. Other recreational amenities would also be installed including a gravel trail system, kiosks, a non-motorized boat put-in, and interpretive signage. Little to no maintenance is anticipated to be required for any of the above-listed Project components, and any increase in fire risk as a

result of maintenance would be minimal. No other infrastructure is proposed as part of the Project. Therefore, this criterion is not applicable and is not further evaluated in this Draft EIR. Please refer to Impact WF-1 for an evaluation of wildfire risk associated with proposed invasive plant management and fire treatment methods.

- **Would the Project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire instability, or drainage changes?** The topography within the Project Area and surrounding vicinity is generally flat, sloping gradually upward the further inland from the coast. The Project Area consists of undeveloped land, a large portion of which is tidally-influenced and/or regularly inundated by water. The Project Area does not contain any residential structures and the Project would not include development of any structures for human occupancy. Due to the above conditions, it is not anticipated that post-wildfire conditions would increase landslide risks or other post-fire instability. Therefore, the Project would have no impact related to exposing people to significant risks, including downslope or downstream flooding or landslides as a result of post-fire instabilities. Please refer to Impact WF-1 for an evaluation of wildfire risk associated with proposed invasive plant management and fire treatment methods.

3.17.4 Methodology

The impact analysis included in this section is based on information taken from CAL FIRE resources, existing conditions, and other information collected from the County of Humboldt. This analysis considers the range and nature of fire treatment methods proposed by the Project and evaluates the primary ways that fire treatment methods could exacerbate wildfire risks.

3.17.5 Impacts and Mitigation Measures

Impact WF-1: Would the Project, due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose Project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The primary fire hazard severity zone applied to the Project Area is LRA Unzoned, with segments of the north and central portions of the Project Area designated as LRA Moderate (CAL FIRE 2008). The Project Area is not located in or near lands classified as a very high fire hazard severity zone, however it is located adjacent to an SRA.

The Project vicinity is rural and generally characterized by open pastures and scattered barns and residences. The Project Area consists of undeveloped land, a large portion of which is tidally-influenced and/or regularly inundated by water. The Project Area does not contain any residential structures and the Project does not include development of any structures for human occupancy. Adjacent land generally consists of open agricultural pasture and farmland. The nearest residential community to the Project Area is on Indianola Reservation Road and the

Wiyot Table Bluff Reservation, approximately 350 feet (107 meters) northeast of the Project Area.

As described in Section 3.17.1, there are several criteria that determine the severity of fire risk associated with a particular site, including climate, topography, vegetation, and proximity to open space. The climate in the study area is classified as Mediterranean, which is characterized as having dry summers and mild, wet winters. The topography within the study area is generally flat, sloping gradually upward the further inland from the coast. The Project Area is predominately vegetated with a mix of invasive and native plants characteristic of marsh habitat within the estuarine restoration portion and partially vegetated with European beachgrass and dune mat within the dune restoration area. These conditions – mild climate, flat/gradually sloping topography, and large areas regularly inundated with water – reduce fire risk. However, the Project Area is densely vegetated and may provide fuel in the event of a wildfire. In particular, the dune restoration area is dominated by highly flammable European beachgrass, which has previously exacerbated wildfires within the study area. As mentioned previously, 12 fires located along the south spit occurred between 2012 and 2017. One of these fires burned 33 acres (13 hectares) within the dune restoration portion of the Project Area. The CAL FIRE Battalion Chief stated that the presence of European beachgrass aided in the spread and severity of the fires along the south spit (R. McLaughlin pers. comm. 2019).

The Project would utilize prescribed burning as one method for controlling and eradicating invasive plants that currently dominate the landscape, including dense-flowered cordgrass and European beachgrass. The use of prescribed burns mimics natural processes, reduces biomass, and provides fire hazard reduction benefits that enhance public and firefighter safety. Removing the excess fuel via prescribed burning would also reduce the intensity, frequency, and hazard associated with future potential uncontrolled grassland fires within the Project Area.

However, the use of prescribed burning treatments represents a potential risk to people or structures if the fire is not properly controlled and spreads beyond the boundary of the proposed burn area. Under this scenario, an improperly managed prescribed burn has the potential to expose people in the vicinity to an uncontrolled wildfire or pollutant concentrations. Accordingly, CDFW would coordinate with CAL FIRE to plan and implement the prescribed burns in accordance with an approved Burn Plan, as described in Chapter 2, Project Description.

When undertaking a prescribed burn project in coordination with CAL FIRE, the liability for conducting the prescribed burn is presumed to be CAL FIRE (CAL FIRE 2018). It is anticipated that CAL FIRE would utilize fire engines and hand crews to create and manage fire operations. Fire breaks would be utilized to divide the Project Area into manageable plots (likely 400 meters by 400 meters). Prescribed burning treatment of both dense-flowered cordgrass and European beachgrass would occur in compliance with applicable regulations and would be implemented in collaboration with CAL FIRE, which would reduce the risk of wildfires during Project implementation to a less-than-significant level.

Please refer to Section 3.8 (Hazards and Hazardous Materials), Impact HAZ-3 for additional discussion of wildfire risk.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.17.6 Cumulative Impacts

Impact WF-C-1: Would the Project contribute to a cumulatively significant impact related to wildfire risk?

As discussed in Impact WF-1, the Project would have a less-than-significant impact associated with the exacerbation of wildfire risks. Similar to the Project, construction and maintenance of other restoration based cumulative projects identified in Table 3-1 could potentially utilize similar fire treatment methods for invasive plant management. Cumulative projects would be subject to compliance with applicable regulations, including federal, state, and local regulations that require implementation of approved burn plans. The Project's contribution to cumulative impacts related to the exacerbation of wildfire risks would not be cumulatively considerable, and therefore less than significant.

Mitigation Measures: No mitigation is necessary.

Level of Significance: Less than significant.

3.17.7 References

- California Department of Forestry and Fire Protection (CAL FIRE). 2007a. Fire Hazard Severity Zones in State Responsibility Areas. Accessed on May 30, 2019, via: http://frap.fire.ca.gov/webdata/maps/statewide/fhszs_map.pdf
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- Humboldt County. 2015. County of Humboldt Emergency Operations Plan – Humboldt Operational Area. March.
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McLaughlin, R. 2019. CAL FIRE Battalion Chief. Personal Communication. August.

National Fire Protection Agency. 2009. Safer from the Start A Guide to Firewise-Friendly Developments. Accessed on May 29, 2019, via:
<https://www.nfpa.org/-/media/Files/Training/certification/CWMS/SaferFromtheStart.ashx?la=en>

Legend

Project Area

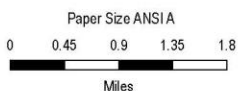
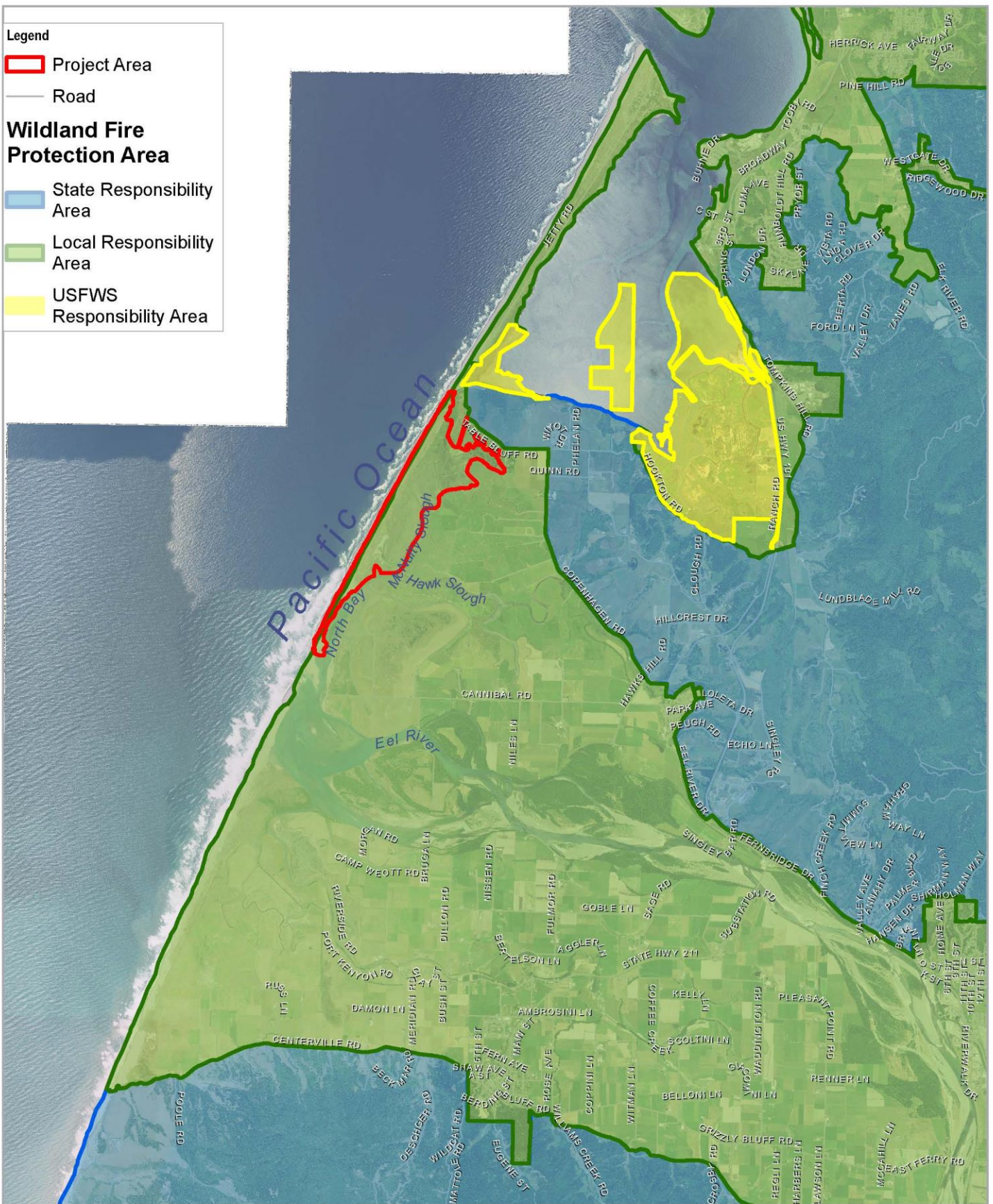
— Road

Wildland Fire Protection Area

State Responsibility Area

Local Responsibility Area

USFWS Responsibility Area



California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/24/2020

Map Projection: Lambert Conformal Conic
Horizontal Datum: North American 1983
Grid: NAD 1983 StatePlane California 1 FIPS 0401 Feet

Fire Protection Responsibility Areas

FIGURE 3.17-1

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 an Environmental Impact Report (EIR) 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 that 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. This section of the CEQA Guidelines (Section 15126.6[b]) also describes the purpose of considering alternatives as a way to identify any measures that would mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code (PRC) Section 21002.1).

The CEQA Guidelines further require that the alternatives discussion allow for meaningful evaluation, analysis, and comparison with the proposed Project’s environmental impacts and that a “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 that would occur if the Project is approved. In certain instances, the no project alternative means “no build” wherein the existing environmental setting is maintained.

4.1.1 Identifying Project Alternatives

A Notice of Preparation (NOP) was circulated for the Project in June of 2018, describing the proposed restoration and enhancement activities to be conducted within the Project Area. During the scoping period, the California Department of Fish and Wildlife (CDFW) received comments expressing concerns related to potential flooding and erosion, potential impacts to waterfowl habitat and hunting opportunities, as well as use of chemicals (herbicide) for invasive plant management. Several Project alternatives have been explored to address these concerns.

The alternatives to the Project analyzed in this chapter include the No Project Alternative, the Estuarine Restoration with Limited Breaches to McNulty Slough Alternative, and the No Herbicide Use Alternative. The environmentally superior alternative is described in Section 4.4, and alternatives that were initially considered but eliminated from detailed consideration in this Draft EIR are described in Section 4.2 below. Resource categories identified as having no impacts under the proposed Project are not discussed below.

4.2 Alternatives Considered but not Carried Forward in this Draft EIR

During the preliminary planning of the Project and the scoping process for the EIR, several alternatives to the Project were evaluated. These alternatives are summarized below, and are evaluated to determine if they meet the qualifications for alternatives receiving full EIR analysis, as required under CEQA.

According to CEQA Guidelines Section 15126.6(a), an EIR should identify alternatives that were considered but rejected and briefly explain the reasons underlying the lead agency's determination. Among the factors that may be used to eliminate alternatives from further detailed consideration in an EIR are: (a) failure to meet most of the basic project objectives; (b) infeasibility; or (c) inability to avoid significant environmental impacts of a proposed project; and 3) the alternative must be potentially feasible. An EIR need not analyze an alternative whose impact cannot be reasonably ascertained and whose implementation is remote and speculative. Furthermore, an EIR need not consider every conceivable alternative, but must consider a reasonable range of alternatives that will foster well-informed decision-making and public participation.

Alternative locations for the Project were not analyzed in this Draft EIR because habitat restoration is by necessity site-specific. Other units of the Eel River Wildlife Area currently have restoration projects underway (e.g., the Salt River Unit) or planned (e.g., the Cannibal Island Unit). Coastal dune restoration through removal of European beachgrass (*Ammophila arenaria*) is also being conducted at several dunes systems in the region, including on the South Spit of Humboldt Bay by the Bureau of Land Management, at the Humboldt Bay National Wildlife Refuge by the U.S. Fish and Wildlife Service, and at Clam Beach State Park by the California Department of Parks and Recreation. However, no dune habitat restoration or European beachgrass eradication projects are planned at the Ocean Ranch Unit of the Eel River Wildlife Area other than the proposed Project.

4.2.1 Partial Estuarine Restoration

The Partial Estuarine Restoration Alternative would restore tidal function to Project Areas A and E through a breach to North Bay and a breach in the levee between Areas A and E, but would maintain Areas B, C, and D as brackish estuarine marsh. Management of Areas B-D as freshwater wetlands would require repair and long-term maintenance of water control infrastructure, including levees and tide gates. Invasive plant management would be the same as what is proposed in the Project. Public access would be modified to provide a different trail configuration (likely

around managed wetland units) and a different location for the non-motorized boat put-in (likely into Area E).

This alternative was dismissed from further consideration because it did not meet several of the basic Project objectives and because current staff and funding levels limit the ability for CDFW to provide long-term maintenance and management support for on-site water control infrastructure. While the Partial Estuarine Restoration Alternative would reduce the level of significance of the Project's hydraulic impacts, it would do so at the expense of achieving the Project's basic goals. One of the Project's primary goals is to restore the natural tidal prism and improve connectivity of tidal and freshwater habitats within the full Project Area. The Partial Estuarine Restoration Alternative would not accomplish this goal. This alternative would not restore tidal function or channel complexity, or improve estuarine habitat, within a large portion (33 percent; 156 acres) of the Project Area. More specifically, it would:

- Provide less critical estuarine habitat for federally listed fish species, including Tidewater Goby, which would be excluded from Areas B-D.
- Provide limited improvements in tidal exchange, connectivity and hydrology even within tidally restored areas because Area A is already tidal and connected to the Eel River estuary.
- Provide minimal ecotone habitat, as most earthen material removed to construct the tidal channel and lower the perimeter levee would be used as fill for a borrow ditch in Area A, and otherwise not available to create high marsh habitat.
- Management of Areas B-D as freshwater wetlands would require repair and long-term maintenance of water control infrastructure, including levees and tide gates, which is at odds with the goal of restoring natural estuarine hydrologic function to the Project Area.

In light of these considerations, the Partial Estuarine Restoration Alternative was rejected from further consideration.

4.2.2 Full Estuarine Restoration

The Full Estuarine Restoration Alternative would restore full tidal inundation to the Project Area by removing all external and internal levees and constructing an internal tidal channel network. Invasive plant management would be the same as what is proposed under the Project, but estuarine public access would be reduced and/or limited to public use by boat.

The Project Area has over four linear miles of internal and external levees. By completely removing all levees from the Project Area, the Full Estuarine Restoration Alternative would require an extensive amount of excavation and earthwork in sensitive estuarine habitat surrounded by tidal sloughs and saltmarsh. Thus, complete levee removal would result in numerous significant environmental impacts, including to: water quality, sensitive species, and the substantial take of State and Federally listed species. Additionally, full levee removal would necessitate hauling by truck and off-site disposal of a substantial amount of fill

material because there is no stable site to deposit that much material within the Project Area that would not impact or replace wetland or other sensitive habitats. Consequently, the amount of levee removal by heavy equipment and off-site hauling would likely result in significant impacts to GHG emissions, air quality, traffic, and potentially solid waste.

The Full Estuarine Restoration Alternative would also not provide a comparable level of flood protection to adjacent landowners and could result in adverse hydraulic impacts and erosion to the eastern levee of McNulty Slough. This alternative would also negatively impact some Project goals, such as reducing public access within the restoration area. For these reasons, the Full Estuarine Restoration Alternative was eliminated from further consideration.

4.2.3 No Invasive Plant Management/Eradication

The No Invasive Plant Management/Eradication Alternative would not actively manage or eradicate invasive plant species within the Project Area. The estuarine restoration portion and the public access components of the Project would be the same as those described for the Project.

Under this alternative, European beachgrass and dense-flowered cordgrass (*Spartina densiflora*) would continue to outcompete native plant communities and likely expand their abundance and distribution in the dunes and estuary, respectively. The Project's two primary goals are to restore and expand natural estuarine function in the restoration area, and to assist in recovery and enhancement of habitat for native fish, invertebrates, wildlife, and plant species. These Project goals cannot be fully achieved without the management and eradication of invasive plant species.

In the saltmarsh, dense-flowered cordgrass affects all aspects of estuarine function including the timing and rate of tidal exchange and hydroperiod; plant and bird diversity, abundance, and distribution; soil macroinvertebrate ecology, nutrient cycling, and structural complexity. Dense-flowered cordgrass can also form dense monotypic stands that out-compete native plant species and diminish habitat for rare native plants such as Humboldt Bay owl's clover and Point Reyes bird's beak.

European beachgrass forms dense monotypic swales throughout most of the dunes in the Project Area. European beachgrass successfully out-competes native dune plant species and thus replaces dune mat vegetation, including several Sensitive Natural Communities. By stabilizing the dunes and preventing active transport of wind-blown sand, European beachgrass prevents formation of vegetated semi-stable and open-sand habitat critical for colonization and persistence of several rare plant species, including beach layia and Menzies' wallflower. Menzies wallflower, which is not known to occur in the Project Area, occurs in dunes just to the north where European beachgrass does not dominate the dunes, and is considered highly likely to become established within the Project Area in restored dunes.

As a result, the No Invasive Plant Management/Eradication alternative was eliminated from consideration because it would not meet the Project's basic goal of restoring natural estuarine and dune functions and natural communities.

4.3 Analysis of Alternatives

This section describes the Project alternatives that were selected and analyzed in accordance with CEQA Guidelines Section 15126.6(a).

4.3.1 Alternative 1: No Project Alternative

Description

Under the No Project Alternative, there would be no changes to the current management of the Project Area and no modifications to the Project Area would be expected. Currently CDFW does not actively manage (i.e., repair, maintain) the internal and external levee system and water control structures in the Project Area. Current CDFW management of the Project Area does not include active habitat restoration or enhancement activities, such as invasive plant eradication efforts and/or State and Federally listed species recovery efforts. Current management of the Project Area also does not include efforts to expand or enhance recreational opportunities at the Project Area.

Under the No Project Alternative, the estuarine wetlands and sloughs in the Project Area would continue to exist as shallow saltmarsh and brackish wetland habitat. The limited freshwater wetlands would remain unchanged but given sea level rise projections for the Project Area, would likely become increasingly saline or brackish in the coming decades. The dune habitat would remain the same and continued to be primarily dominated by European beachgrass.

Analysis

The No Project Alternative would have similar impacts to the proposed Project in terms of Public Services, Land Use, and Agriculture because no additional public services would be required and the existing land use would remain as wetlands and wildlife habitat, which would continue to not support agriculture operations. The No Project Alternative would have lesser impacts than the proposed Project for all other resource categories except for biological resources and hydrology because over time, these resources would continue to degrade.

Current CDFW management of the Project Area does not include repair or maintenance of the levees and water control structures at the Project Area. Consequently, this infrastructure would continue to degrade and erode. The levees would continue to prevent full tidal exchange throughout most of the estuarine habitat in the Project Area and thus estuarine and saltmarsh habitats would remain in a degraded state providing lower functioning habitat values for fish and wildlife. The No Project Alternative would not control or eradicate invasive plant species in tidal areas or in the dunes and would not improve public access or recreational opportunities.

If the Project Area is left as it currently exists, recovery and enhancement of native species and habitat would be delayed, would not occur at all, or may continue to degrade, and erosion of the levees would continue to negatively impact hydrology and water quality.

Under the No Project Alternative, there would be no substantial improvement to fish and wildlife habitat values, natural dune function, and recovery of Sensitive Natural

Communities. Project goals and several supplementary objectives would not be attained. The No Project Alternative would not improve tidal channel complexity within the Project Area, and the existing level of flood protection to adjacent properties to the east would continue to diminish over time if portions of the levee along McNulty Slough fail and adversely affect hydrology through increased scour and velocity.

4.3.2 Alternative 2: Estuarine Restoration with Limited Breaches to McNulty Slough

Description

As depicted on Figure 4-1, Alternative 2 includes estuarine restoration of Areas A-E with external breaches limited to North Bay (Area A) (BR-1) and McNulty Slough (Area D) (BR-4) to minimize adverse hydraulic impacts on adjacent property owners. Internal restoration actions and public access improvements would be similar to the proposed Project. The changes are detailed below:

- Two exterior breaches (BR-2 and BR-3) would not be constructed and the existing damaged tide-gate that currently connects Area B to McNulty Slough would be removed or buried in place to eliminate the hydraulic connection between the Project Area and McNulty Slough at that location
- Levees along McNulty Slough would not be lowered
- The new channel extending into Area A from the exterior breach to North Bay (BR-1) would not be constructed
- The interior channel network would be reconfigured to connect Areas A, B, and C
- Interior Breach 3 (BI-3) and the tidal channel connecting Areas B and E would not be constructed
- The existing culvert (or a culvert of similar size / configuration) would remain at the interior breach between Areas A and E (BI-4) (i.e., it would not be increased in size)
- Habitat fill would be concentrated in the southern portion of Area B (no habitat fill would be placed in Areas A, C, or D)
- Ditch blocks would be added along the interior channel in the northern portion of Area A, near the interior breach between Areas A and B (BI-1)

The remaining alterations to existing levees, proposed recreational enhancements, and invasive plant management aspects of the Project would remain the same as the proposed Project. This alternative would meet the goals and supplementary objectives of the Project and would reduce significant and unavoidable hydraulic impacts within McNulty Slough that are expected to occur under the Project to a less-than-significant level.

Analysis

Aesthetics

Alternative 2 would result in similar aesthetic impacts to the Project Area as compared to the proposed Project (less than significant). The invasive plant management activities proposed for removal of invasive plants would still occur, which would have the greatest permanent visual impacts within the Project Area. Temporary visual impacts from the presence of construction equipment would generally be the same as the proposed Project since they include similar construction and invasive plant management methods, equipment and schedules. Therefore, Alternative 2 would have equivalent aesthetic impacts as compared to the proposed Project.

Agricultural Resources

Alternative 2 would have similar agricultural resource impacts as the Project with respect to converting agricultural land to a non-agricultural use (i.e., less than significant). Although Alternative 2 would alter the estuarine restoration area differently, it would still inundate a near equivalent portion of potential prime farmland soils within the Project Area. However, as stated in Section 3.2, the Project Area has not been in active agricultural production for over 30 years, and the Project would not convert active prime farmland to non-agricultural use or otherwise conflict with policies related to agricultural lands under the Farmland Mapping and Monitoring Program (FMMP) and the California Coastal Act (Coastal Act). Therefore, the impact to agricultural land would be less than significant for Alternative 2 and the same as the Project. Neither the proposed Project nor this alternative would have any impacts to forest resources because there are no forest resources within the Project Area.

Air Quality

Like the proposed Project, Alternative 2 would result in the generation of criteria pollutants and dust during construction of the estuarine restoration portion of the Project and implementation of invasive plant management activities. The air quality impacts under the proposed Project were determined to be less than significant with implementation of Mitigation Measure AQ-1, which complies with the best management practices (BMP) recommended by air districts to reduce construction-related dust. The impacts of Alternative 2 would similarly be less than significant with implementation of Mitigation Measure AQ-1. Comparatively, construction-related air quality emissions included in Alternative 2 would be less than the estimated emissions for the proposed Project, given that there would be a reduction in the amount of overall earthwork.

Biological Resources

Impacts to biological resources that could potentially occur under the proposed Project were determined to be less than significant with implementation of mitigation measures. During construction, impacts to biological resources under Alternative 2 would be marginally reduced due to the smaller area disturbed by the estuarine restoration component. However, the potential to impact the species identified in Section 3.4.5 during the construction phase would remain the same under Alternative 2, and all identified mitigation measures would remain applicable and

would be implemented (Mitigation Measures BIO-1a, HHM-2, HHM-4, WQ-1, WQ-2, BIO-1b, BIO-1c, BIO-1d, BIO-1e, BIO-1f, and BIO-3). It is anticipated that the elimination of the interior breach between Area B and Area E (BI-3) under Alternative 2 would improve habitat for Tidewater Goby by preserving the hydrologic conditions preferred by the species (i.e., slower moving brackish water). Implementation of the invasive plant management component would still occur as under the proposed Project and therefore Alternative 2 would have equivalent impacts to biological resources from removal of European beachgrass and dense-flowered cordgrass.

Cultural Resources

Alternative 2 is anticipated to result in less direct disturbance of the Project Area as compared to the proposed Project. However, as with the proposed Project, construction and maintenance activities could still unearth unknown cultural resources, which, if realized, would be a significant impact. The same mitigation measures for the proposed Project (Mitigation Measures CR-1, CR-2, CR-3, CR-4, and CR-5) would be applicable and implemented under Alternative 2 to reduce impacts to a less-than-significant level.

Geology and Soils

Alternative 2 would result in slightly less earthwork including a reduction in excavation of levees and sediment from the estuarine restoration portion of the Project. However, the same mitigation measures for the proposed Project (Mitigation Measures HWQ-1, HWQ-2, WQ-6, and GEO-1) would be applicable and implemented under Alternative 2 to reduce potential impacts to a less-than-significant level.

Greenhouse Gas Emissions

Like the proposed Project, Alternative 2 would result in a temporary increase in greenhouse gas (GHG) emissions during Project construction, including exhaust emissions from on-road haul trucks, worker commute vehicles, and off-road heavy equipment. Comparatively, construction related GHG emissions expected to occur under Alternative 2 would be less than the estimated emissions for the proposed Project because there would be a reduction in the amount of earthwork. As with the proposed Project, Alternative 2 would result in a less than significant impact to GHG emissions, because it would not exceed emission thresholds or conflict with an applicable GHG plan, policy, or regulation.

Hazards and Hazardous Materials

Although Alternative 2 would result in less excavation, the boundaries of the Project Area would remain the same, therefore the risk for accidental spills of construction related fuels would also remain the same as the proposed Project. Invasive plant management activities would still occur under Alternative 2, therefore potential risks such as accidental release of herbicide and potential fire risk would be equivalent to the proposed Project. The same mitigation measures for the proposed Project (Mitigation Measures HHM-1, HHM-2, HHM-3, HHM-4, HHM-5, and WQ-2) would apply and be implemented under Alternative 2 to reduce impacts to a less-than-significant level. Therefore, the impacts related to hazards and hazardous materials for Alternative 2 would be equivalent to the proposed Project.

Hydrology and Water Quality

Under the proposed Project, hydrology and water quality impacts were generally determined to be less than significant with implementation of mitigation measures, with the exception of the potential for the Project to increase velocity and sheer stress in McNulty Slough, which could erode the eastern levee and potentially flood adjacent private agricultural lands, both potentially significant and unavoidable impacts (reference Section 3.9.5).

The proposed Project includes four breaches (BR-1, BR-2, BR-3, BR-4) to the exterior levee on McNulty Slough. Alternative 2 proposes only two breaches to the McNulty Slough levee by eliminating breaches BR-2 and BR-3. Alternative 2 would result in more tidal flow entering and leaving the Project Site through BR-1, within the Project Area, as opposed to within McNulty Slough as would occur with the proposed Project. Consequently, the elimination of the two exterior breaches to McNulty Slough under Alternative 2 would reduce post-construction flow velocities and shear stress relative to the proposed Project, such that they would be similar to baseline conditions (AECOM 2019).

As a result, the potential for increased erosion of the eastern levee of McNulty Slough (and potential for flooding of private lands) would be avoided. The same mitigation measures for the proposed Project (Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-2, WQ-6, HHM-2, and HHM-4) would be applicable and implemented under Alternative 2, which in conjunction with the elimination of two exterior breaches, would reduce impacts to a less-than-significant level.

Noise

Similar to the proposed Project, Alternative 2 would generate noise when heavy equipment is used in the Project Area (i.e., during construction, invasive plant management, and maintenance activities). Noise-generating equipment and activities would generally occur at a slightly less amount of time and utilize the same equipment under Alternative 2 as the proposed Project. Therefore, noise impacts expected to occur under Alternative 2 would be less than significant and equivalent to what would occur under the proposed Project.

Public Services and Utilities

It is anticipated that Alternative 2 would have minimal impacts to public services and utilities similar to the proposed Project. Alternative 2 would not induce population growth and would not increase demand for public services or utilities. Therefore, impacts to public services and utilities expected to occur under Alternative 2 would be less than significant and equivalent to what would occur under the proposed Project.

Recreation

Alternative 2 would implement similar public access improvements as the proposed Project (with minor deviations in trail locations based on the location of internal levees). Therefore, Alternative 2 would generally result in the same temporary and permanent less-than-significant impacts caused by the closure of the Project Area during construction and increased use after the Project is complete.

Transportation

Transportation impacts expected to occur under Alternative 2 would be equivalent to the proposed Project. Compared to the proposed Project, construction would require similar construction worker and equipment trips, and a comparable number of invasive plant management, maintenance, and public access trips would occur over the long-term. Therefore, impacts to transportation under Alternative 2 would be less than significant and equivalent to what would occur under the proposed Project.

Tribal Cultural Resources

Alternative 2 is anticipated to result in less direct disturbance of the Project Area compared to the proposed Project. However, as with the proposed Project, construction and maintenance activities could still unearth unknown tribal cultural resources, which, if realized, could result in a significant impact. The same mitigation measures for the proposed Project (Mitigation Measures TCR-1, CR-1, and CR-2) would be applicable and implemented under Alternative 2 to reduce impacts to a less-than-significant level.

Energy Resources

Comparatively, construction-related energy use under Alternative 2 would be less than the proposed Project because there would be a slight reduction in the amount of earthwork and overall construction activity. Energy use after the estuarine restoration component of the Project is complete would be comparable to the Project because invasive plant management, maintenance and public access activities would be the same. As with the proposed Project, Alternative 2 would result in a less than significant impact to energy resources because it would not result in a substantial increase in energy use, inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, or conflict with an applicable plan for energy efficiency.

Wildfire

Similar to the proposed Project, invasive plant management under Alternative 2 could include the use of prescribed burns to manage European beachgrass and dense-flowered cordgrass. As with the proposed Project, all prescribed burns would be implemented according to an approved burn plan and supervised by the California Department of Forestry and Fire Protection (CAL FIRE). Therefore, impacts to wildfire risk expected to occur under Alternative 2 would be less than significant and equivalent to what would occur under the proposed Project. With both the proposed Project and Alternative 2, after project implementation the wildfire risk is anticipated to be much lower than current conditions because of the removal of the highly flammable invasive European beachgrass.

4.3.3 Alternative 3: No Herbicide Use

Description

Alternative 3 would not use herbicide to treat invasive plants. All other components, including estuarine restoration, remaining invasive plant management activities

(e.g., mechanical removal and prescribed burning), and the public access improvements would be the same as the proposed Project.

Alternative 3 would attain the Project's basic estuarine and dune restoration goals and supplementary objectives and would avoid any potential impacts associated with herbicide use for invasive plant management.

Analysis

Aesthetics

Similar to the proposed Project, Alternative 3 would have less-than-significant impacts to aesthetic resources. Temporary visual impacts caused by the presence of construction equipment in the Project Area would generally be the same as the proposed Project (i.e., same equipment and methods), although not using herbicide would likely increase the need to use heavy equipment and gas-powered handheld mowing equipment to manage invasive plant species, which would prolong their presence in the Project Area. In the long-term, the removal of invasive plants within the Project Area would occur over the same area as proposed under the Project, resulting in the same permanent aesthetic benefit to the Project Area. Therefore, Alternative 3 would likely have a somewhat greater aesthetic impact during invasive plant management activities, but a similar long-term aesthetic benefit after work is complete compared to the proposed Project.

Agricultural Resources

As with the proposed Project, Alternative 3 would have similar agricultural resources impacts with respect to converting agricultural land to a non-agricultural use (i.e., less than significant). Alternative 3 would alter the estuarine restoration area as described under the proposed Project, and would inundate the same portion of potential prime farmland soil in the Project Area. However, as stated in Section 3.2, the Project Area has not been in active agricultural production for over 30 years, and the Project would not convert active prime farmland to non-agricultural use or otherwise conflict with policies related to agricultural lands under the FMMP and the Coastal Act. Therefore, the impact on agricultural land for Alternative 3 would be less than significant and the same as the proposed Project. Neither the proposed Project nor this alternative would have any impacts to forest resources because there are no forest resources within the Project Area.

Air Quality

Similar to the proposed Project, Alternative 3 would result in the generation of criteria pollutants and dust during construction of the estuarine restoration portion and implementation of invasive plant management activities. The air quality impacts expected to occur under the proposed Project were determined to be less than significant with implementation of Mitigation Measure AQ-1, which complies with the BMPs recommended by air districts to reduce construction-related dust. The same mitigation measure would apply and be implemented under Alternative 3.

However, instead of herbicide use, Alternative 3 would primarily rely on heavy equipment and gas-powered handheld mowing equipment, in addition to prescribed burning, to manage invasive plants. The use of heavy equipment and gas-powered handheld mowing equipment would take considerably more time and effort to

achieve invasive plant management objectives compared to including herbicide use and would have higher air quality emissions. Therefore, although air quality emissions under Alternative 3 would be less than significant, they would be greater than the proposed Project.

Biological Resources

Impacts to biological resources expected to occur under the proposed Project were determined to be less than significant with implementation of mitigation measures. Impacts expected to occur under Alternative 3 would similarly result in less than significant biological resource impacts with implementation of appropriate mitigation measures. With the elimination of herbicide treatment of invasive plants, Mitigation Measures WQ-1, and WQ-2 would no longer be needed or implemented. The remaining mitigation measures (Mitigation Measures BIO-1a, HHM-2, HHM-4, BIO-1b, Bio-1c, BIO-1d, BIO-1e, BIO-1f, and BIO-3) would be applicable and implemented under Alternative 3.

Given that other invasive plant treatment methods would need to be used with greater intensity and duration in the absence of herbicide use, it is expected to take years longer for the Project to achieve its invasive plant management goals. During this delay in achieving restoration goals, the ecological values of the estuarine and dune habitat in the Project Area would remain in their degraded condition and State and Federally listed species would not benefit from an increase in abundance, distribution, or fitness expected from the habitat enhancement actions proposed by the Project. For these reasons, Alternative 3 is considered environmentally inferior to the proposed Project with regard to biological resources, although impacts to biological resource would remain less than significant.

Cultural Resources

Alternative 3 would result in the same amount of direct disturbance of the Project Area as the proposed Project. Similar to the proposed Project, construction and maintenance activities could potentially unearth unknown cultural resources. The risk of discovering currently unknown cultural materials would be identical to the proposed Project as the same area would be disturbed and would be reduced to a less-than-significant level with implementation of the same mitigation measures (Mitigation Measures CR-1, CR-2, CR-3, CR-4 and CR-5). Therefore, the impacts related to cultural resources would be equivalent to the proposed Project.

Geology and Soils

Similar to the proposed Project, Alternative 3 would have less than significant impacts to geology and soils. The same mitigation measures for the proposed Project would be applicable to this alternative (Mitigation Measures HWQ-1, HWQ-1, WQ-6, and GEO-1) and implemented within the estuarine restoration portion of the Project Area. Because the same area would be disturbed as under the proposed Project, impacts to geology and soils associated with Alternative 3 would be less than significant and equivalent to what would occur under the proposed Project.

Greenhouse Gas Emissions

As with the proposed Project, Alternative 3 would have less than significant impacts regarding GHG emissions. Energy use, and thus GHG emissions, for invasive plant

management would likely be higher in Alternative 3 than the proposed Project because instead of herbicide treatment, heavy equipment or gas-powered handheld mowing equipment, along with prescribed burning, would be used. Therefore, it is assumed that Alternative 3 would generate greater GHG emissions than the proposed Project. Although there would be increased GHG emissions under Alternative 3, a less than significant impact would occur because the alternative would not exceed emission thresholds or conflict with an applicable GHG plan, policy, or regulation. However, implementation of Alternative 3 is considered environmentally inferior to the proposed Project regarding GHG emissions.

Hazards and Hazardous Materials

Alternative 3 would have roughly the same potential hazards and hazardous materials impacts as the proposed Project because while no herbicide treatment would take place, heavy equipment and gas-powered handheld mowing equipment use would increase in order to manage invasive plant species. Mitigation Measures HHM-1, HHM-2, and HHM-5 would apply and be implemented under this alternative, however, Mitigation Measures HHM-3, HHM-4, WQ-2, would no longer be required because herbicide treatment would not be used. The impacts related to hazards and hazardous materials under Alternative 3 are expected to be similar to the proposed Project because the increased potential for spills of fuel and lubricant from the increased use of heavy equipment and gas-powered handheld mowing equipment would offset the lower hazardous materials spill risk from herbicide use.

Hydrology and Water Quality

The level of impact from Alternative 3 on hydrology and water quality would be roughly the same as the proposed Project. As with the proposed Project, hydrology and water quality impacts would be less than significant with implementation of Mitigation Measures HWQ-1, HWQ-2, HWQ-3, WQ-2, WQ-6, HHM-2, and HHM-4, with the exception that Alternative 3, like the proposed Project, would increase velocity and shear stress in McNulty Slough, which could erode the eastern levee and potentially flood adjacent private lands, both potentially significant and unavoidable impacts.

Noise

Similar to the proposed Project, implementation of Alternative 3 would generate noise during use of heavy equipment. Elimination of the use of herbicide to treat invasive plants would not lessen the noise impacts as the herbicide application tools do not generate a significant amount of noise. The impact from noise from Alternative 3 would likely be higher than the proposed Project due to an increased reliance on heavy equipment or gas-powered handheld mowing equipment and their longer duration of use. However, similar to the proposed Project, the impact from noise under Alternative 3 would be less than significant.

Public Services and Utilities

Alternative 3 would have minimal impacts to public services and utilities, similar to the proposed Project. Alternative 3 would not induce population growth and would not increase demand for public services or utilities. Therefore, impacts to public services and utilities under Alternative 3 would be less than significant and equivalent to what would occur under the proposed Project.

Recreation

Alternative 3 would implement the same recreational facility improvements as the proposed Project. Therefore, Alternative 3 would result in very similar less-than-significant recreational impacts associated with the closure of the Project Area during construction and invasive plant management, and the increased use of recreational amenities by the public after the Project is complete.

Transportation

Transportation impacts expected to occur under Alternative 3 would be equivalent to the proposed Project because construction would require the same construction worker and equipment trips, and a comparable number of invasive plant management, maintenance and public access trips would occur over the long-term. All recreational components would still be implemented, and anticipated recreational trips would not change under Alternative 3. Therefore, impacts to transportation under Alternative 3 would be less than significant, which is equivalent to what would occur under the Project.

Tribal Cultural Resources

Alternative 3 would disturb an equivalent portion of the Project Area compared to the proposed Project. Therefore, as with the proposed Project, construction and maintenance activities could unearth unknown tribal cultural resources, which, if realized, could result in a significant impact. Mitigation Measures TCR-1, CR-1, and CR-2 would be applicable and implemented under Alternative 3 to reduce impacts to a less-than-significant level.

Energy Resources

Construction-related energy use under Alternative 3 would be equivalent to that needed for the proposed Project because all estuarine restoration components would be implemented as described in Chapter 2 (Project Description). Energy use for invasive plant management would likely be higher under Alternative 3 than the proposed Project because instead of herbicide treatment, heavy equipment or gas-powered handheld mowing equipment would be relied on more heavily. The increased use of heavy equipment and gas-powered handheld mowing equipment would likely be a much more extensive, routine, and longer-term invasive plant management method requiring more energy use than if herbicide use were incorporated into the suite of management options. However, as with the proposed Project, Alternative 3 would result in a less than significant impact to energy resources, because it would not result in a substantial increase in energy use, inefficient, wasteful, or unnecessary consumption of fuels or other energy resources, or conflict with an applicable plan for energy efficiency.

Wildfire

Similar to the proposed Project, Alternative 3 includes the use of prescribed burns to manage invasive plants. As with the proposed Project, all prescribed burns would be implemented according to an approved burn plan and supervised by CAL FIRE. Therefore, the impacts related to wildfires would be equivalent to the proposed Project and less than significant.

4.4 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. 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 a habitat restoration and enhancement project.

As enumerated in greater detail in Section 2.2, the Project's two primary goals are:

1. To restore and expand natural estuarine function in the restoration area, and to assist in recovery and enhancement of habitat for native fish, invertebrates, wildlife, and plant species.
2. To restore natural dune function, and to assist in recovery and enhancement of habitat for native species, State and Federally-listed or otherwise sensitive plants, and associated natural communities.

Implementation of the Project would:

1. Facilitate the recovery of a number of State and Federally-listed fish and rare plant species.
2. Restore natural ecosystem functions at a landscape scale to a diverse mosaic of estuarine tidal slough and saltmarsh and coastal dune habitats using an ecosystem-based management approach.
3. Minimize CDFW long-term maintenance and management efforts and expenditures by allowing for natural ecological processes to maintain the Project Area, rather than relying on on-going maintenance and repair of constructed levees and tide gates.
4. Restore Sensitive Natural Communities.
5. Improve public access and recreational opportunities in the Project Area.

Most of the proposed Project's adverse impacts would be short-term and related to ground disturbance during construction and management of invasive plants. 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, listed above and enumerated in Section 2.2.

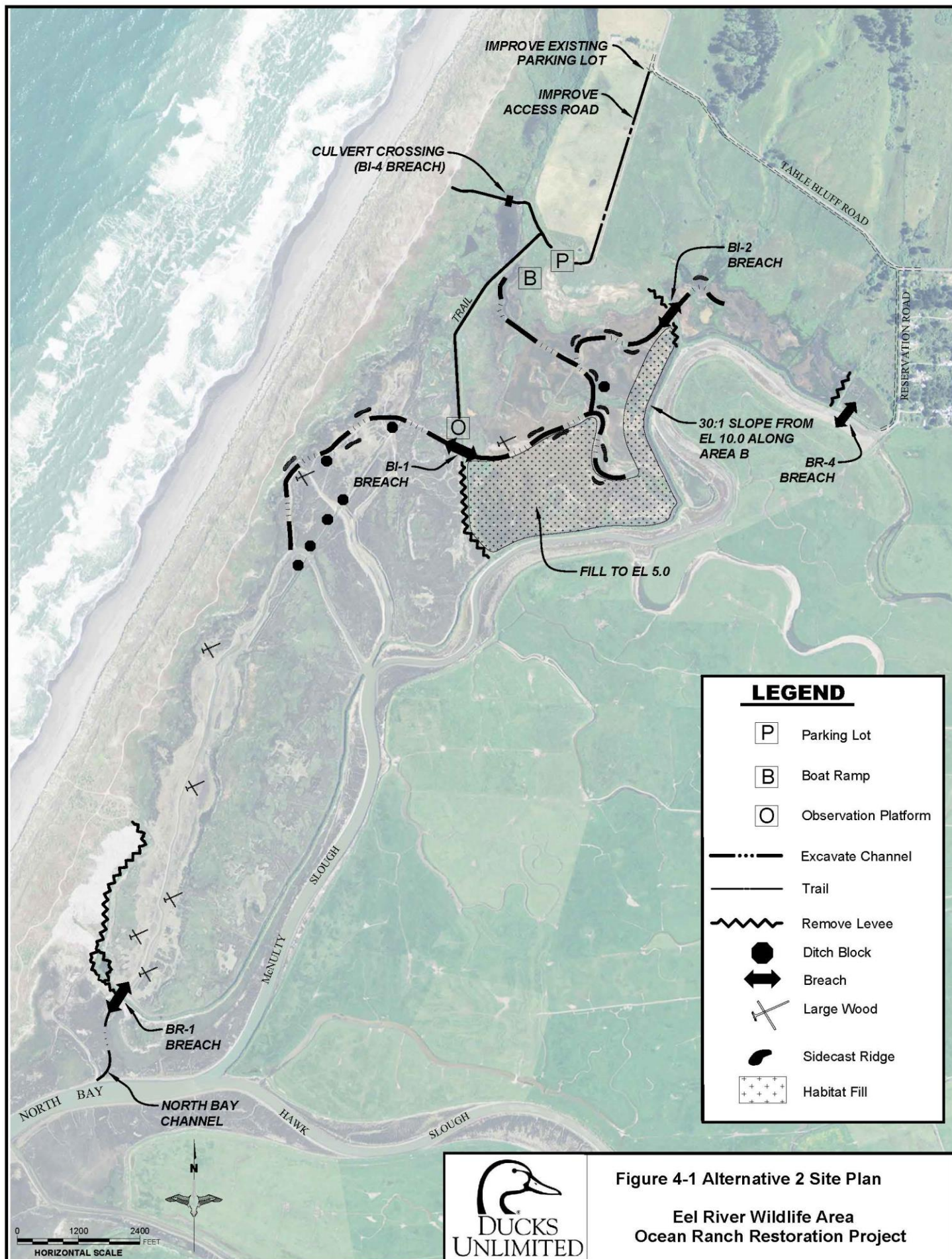
The proposed Project, as described Section 3.9, Hydrology and Water Quality, would result in two significant and unavoidable impacts. These significant and unavoidable impacts include erosion of the eastern levee along McNulty Slough (Impact HWQ-3) and potential flooding of adjacent private agricultural lands (Impact HWQ-4). For this reason, the proposed Project is not deemed the Environmentally Superior Alternative.

Alternative 2 (Estuarine Restoration with Limited Breaches to McNulty Slough) would reduce these potentially significant and unavoidable hydraulic impacts within McNulty Slough to a less than significant level. The fewer breaches proposed under Alternative 2 would direct more tidal flow into and out of the Project Area itself, rather than increasing flow volume and velocities in McNulty Slough (which is attributed with potential increased erosion to McNulty Slough's eastern levee under the proposed Project). Therefore, the flow velocities within McNulty Slough from Alternative 2 would be similar to baseline conditions, and the potential impact from scour or erosion less than significant. Alternative 2 would meet all of the Project's primary goals and also provide improved habitat quality to Tidewater Goby by preserving desirable hydrologic conditions in Area E and the northern portion of Area A.

While Alternative 3 (No Herbicide Use) would have a reduced risk of hazardous materials exposure or spills from herbicides than the proposed Project, other environmental impacts of Alternative 3 are expected to be greater than the proposed Project. Heavy equipment and gas-powered handheld mowing equipment would be used in place of herbicide under Alternative 3, which would result in greater energy use, air quality impacts, and GHG emissions than the proposed Project. Also, by not using herbicide to manage invasive plants, it is likely that additional treatments would be necessary to eradicate dense-flowered cordgrass and European beachgrass from the Project Area. These additional invasive plant management treatments, implemented over a longer time period, would likely considerably delay achieving the Project's objective to eradicate invasive species and restore natural estuarine and dune function. For these reasons, Alternative 3 is not considered the Environmentally Superior Alternative. Consequently, Alternative 2 (Estuarine Restoration with Limited Breaches to McNulty Slough) is considered the Environmentally Superior Alternative.

Table 4-1 Comparison of Alternatives to the Proposed Project

Potential Impact	Alternative 1 No Project	Alternative 2 Limited Estuarine Restoration	Alternative 3 No Herbicide Use
Aesthetics	superior	equivalent	equivalent
Agricultural Resources	equivalent	equivalent	equivalent
Air Quality	superior	equivalent	inferior
Biological Resources	inferior	superior	inferior
Cultural Resources	superior	equivalent	equivalent
Geology and Soils	superior	equivalent	equivalent
Greenhouse Gas Emissions	superior	equivalent	inferior
Hazards and Hazardous Materials	superior	equivalent	superior
Hydrology and Water Quality	superior	superior	equivalent
Land Use	equivalent	equivalent	equivalent
Noise	superior	equivalent	inferior
Public Services and Utilities	equivalent	equivalent	equivalent
Recreation	inferior	equivalent	equivalent
Transportation	superior	equivalent	equivalent
Tribal Cultural Resources	superior	equivalent	equivalent
Energy	superior	equivalent	inferior
Wildfire	inferior	equivalent	equivalent



5. Other CEQA Required Sections

5.1 Environmental Issues Determined Not to Be Significant

CEQA Guidelines Section 15128 requires an Environmental Impact Report (EIR) to briefly describe any possible significant effects that were determined not to be significant and were, therefore, not discussed in detail in the Draft EIR. For the purposes of this Draft EIR, an evaluation of mineral resources and population and housing were eliminated from further consideration during the scoping phase of the environmental analysis for the reasons presented below.

5.1.1 Mineral Resources

There are no existing mining operations in the Project Area. The Project Area is primarily comprised of fine silt, sand and water, and contains no known mineral resources available for extraction. There are no Surface Mining and Reclamation Act-designated parcels located within the Project Area. Although Humboldt County has not yet been included in the California Mineral Land Classification System by the State Mining & Geology Board to designate lands containing mineral deposits of regional or statewide significance, it is highly unlikely the Project Area would qualify for this designation. Therefore, no impact to mineral resources would result.

5.1.2 Population and Housing

The proposed Project would not add any new homes or businesses, nor extend any new roads or development-related infrastructure on the site. The Project would not displace any housing or people, on or adjacent to the site. No aspect of the Project would induce substantial population growth or displace substantial numbers of housing or people. Therefore, no impact to population and housing would result. For further discussion of the Project's growth-inducing impacts, refer to Section 5.3 below.

5.2 Energy Use

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." An evaluation of potential impacts related to the energy consumption of the Project and the applicability of state or local plans for renewable energy and energy efficiency is discussed in Section 3.16 (Energy).

5.3 Growth Inducement

The CEQA Guidelines require that an EIR evaluate the growth inducing impacts of a proposed project. The CEQA Guidelines describe growth-inducing impacts in the following manner:

“Discuss the 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 (a major expansion of a waste water treatment plant might, for example, allow for more construction in service areas). Increases in the population may tax existing community service facilities, requiring construction of new facilities that could cause significant environmental effects. Also discuss the characteristic of some projects which may encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively. It must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment.” (CEQA Guidelines Section 15126.2[d]).

The Project is designed to restore the natural tidal prism, improve connectivity of tidal and freshwater habitats, and control and eradicate invasive plants within the Project Area. The Project does not involve construction of new housing that would result in direct growth inducement.

Construction of the tidal restoration portion of the Project is expected to occur over two seasons, approximately 120 days each between May and October, likely for the years 2021 through 2022. Given the relatively moderate construction period spread out over two seasons, and workforce needs (less than 30 construction personnel per day), no new housing or services would be needed to support the temporary employment demand.

Management of invasive plants and periodic maintenance of infrastructure, including road, parking area, and trail maintenance, would be completed by limited CDFW staff. No increase in population is anticipated as a result of job opportunities resulting from Project implementation. The Project would also 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 Project would not induce population growth and does not include characteristics that would encourage or facilitate other growth inducement activities.

5.4 Significant and Unavoidable Impacts of the Proposed Project

Section 15126.2(c) of the CEQA Guidelines require that an EIR identify any significant environmental effects that cannot be avoided if the Project were implemented, including those that can be mitigated but not reduced to a level of insignificance.

The analysis presented in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, concludes that implementation of the proposed Project would result in two significant and unavoidable impacts.

Under Impact HWQ-3, which evaluates the potential for the Project to alter the existing drainage pattern of the site or result in substantial erosion on-or off-site, it was determined that the Project could result in significant and unmitigatable erosion off-site. Proposed breaches to McNulty Slough, and the resulting changes in hydraulics, would result in increased flow velocities in upper McNulty Slough that would increase the potential for bed scour and bank erosion. Specifically, the

velocity and shear stress results from the hydraulic model indicate that the eastern levee of McNulty Slough, which is in private ownership, could be adversely impacted by increased erosion potential under the Project, which would be a significant impact (AECOM 2019). To reduce this impact, CDFW considered armouring the eastern levee, constructing a setback levee on the eastern bank, and widening or deepening McNulty Slough. The legal feasibility of the armouring the eastern levee of McNulty Slough and setting back the levee is uncertain, because the eastern levee of McNulty Slough is on private property and CDFW does not have a right of access to the property. As a result, the feasibility of these mitigation measures is questionable considering they would require CDFW to implement a Project action on property it does not own, does not have legal responsibility for, and cannot foreseeably purchase or acquire. In addition, based on the hydraulic modelling results, it was determined that dredging would not effectively reduce water velocities and potential for erosion, and would result in additional potentially significant impacts on sensitive habitats, fish and wildlife, and water quality. Therefore, the off-site erosion impact is considered both significant and unmitigable.

Under Impact HWQ-4, which evaluates the potential impact of flooding on- or off-site, it was determined that the Project could result in flooding of private agricultural fields east of the Project Area if the levee on the eastern side of McNulty Slough was breached or otherwise compromised as a result of changes in hydraulics resulting from the Project. As described above, several mitigation measures were evaluated to protect the existing levee, however none were determined to be feasible. Therefore, without mitigation, the potential impact remains significant and unmitigable.

5.5 Significant Irreversible Environmental Changes

Section 15126.2(d) of the CEQA Guidelines requires that an EIR include a discussion of significant irreversible environmental changes that would result from project implementation. The CEQA Guidelines describe irreversible environmental changes in the following manner:

“Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.” (CEQA Guidelines Section 15126.2[d]).

Construction activities associated with the Project would result in an irretrievable and irreversible commitment of natural resources through the use of construction materials, such as gravel and pavement for the proposed public access facilities. The Project would also require the commitment of energy resources to fuel and maintain construction equipment (such as gasoline, diesel and oil) during the construction period.

Following construction, daily activities would likely see a minor increase in energy consumption when the recreational amenities are available to the public. The presence of a multi-use trail, non-motorized boat put-in, and other recreational components is anticipated to generate approximately 30-40 additional trips to the Project Area per week, compared to existing conditions. Additionally, maintenance activities would require use of CDFW vehicles and use of hand-held tools, and some heavy equipment. Although the Project would utilize fossil-fuel powered equipment and vehicles, the use of maintenance equipment would be periodic and short-term and the vehicle use would only be increased slightly compared to existing conditions. 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.

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Appendices

Appendix A – Notice of Preparation (NOP)



California Department of Fish and Wildlife – Lead Agency

Notice of Preparation of a
Draft Environmental Impact Report for the
Ocean Ranch Restoration Project

June 13, 2018

Notice of Preparation of a Draft Environmental Impact Report for the Ocean Ranch Restoration Project

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June 13, 2018

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Appendices

Appendix A - Figures

1. Introduction

1.1 CEQA Requirements

The Ocean Ranch Restoration Project (Project) is subject to the requirements of the California Environmental Quality Act (CEQA). The CEQA lead agency and decision-making body is the California Department of Fish and Wildlife (CDFW). The CDFW is responsible for assuring the completion of the appropriate evaluation and processes required by CEQA. The CDFW has the sole responsibility to make the appropriate findings and determinations with respect to the CEQA process and disposition of the Project. The purpose of this Notice of Preparation (NOP) is to inform responsible and trustee agencies and the public that an Environmental Impact Report (EIR) will be prepared for the Ocean Ranch Restoration Project (Project), and to solicit comments on the proposed project and potential impacts to be addressed in the EIR. The EIR being prepared is intended to satisfy the requirements of CEQA (Public Resources Code, Division 13, Section 21000-21177), and the State CEQA Guidelines (California Code of Regulations, Title 14, Chapter 3, Section 15000-15387).

1.2 General Information

Protect Title: Ocean Ranch Restoration Project

Lead Agency: California Department of Fish and Wildlife
Northern Region (Region 1) – Eureka Field Office
619 2nd Street
Eureka, CA 95501
Attention: Gordon Leppig, Sr Environmental Scientist Supervisor

1.2.1 Availability of Project Documents/Files

This NOP is available for review during the business week at the CDFW Northern Region (Region 1) Eureka field office between the hours of 8:00 a.m. to 12:00 p.m. and 1:00 p.m. to 4:30 p.m. The CDFW Region 1 field office is located at 619 2nd Street in Eureka, California. An electronic version of this NOP is available for review on the CDFW website (<https://www.wildlife.ca.gov/Notices>).

1.2.2 Written Comments

Written comments on the scope of the EIR can be sent to Gordon Leppig at the CDFW Region 1 Eureka field office at the above-noted address. Additionally, comments may be submitted electronically via email to:

Email: orurestoration@wildlife.ca.gov

1.2.3 Comment Period

CEQA Guidelines Section 15082 (b) requires a 30-day response period for input about the scope and content of the EIR. The comment period for the NOP begins

on June 13, 2018, and ends on July 16, 2018. The deadline for submitting written comments is July 16, 2018 at 5:00 p.m.

1.2.4 Public Scoping Meeting

A public scoping meeting will be held to further inform agencies and interested parties about the Project, and to accept comments on the environmental issues germane to the Project. The meeting will be held on July 9, 2018 from 5:30 p.m. to 7:00 p.m. at the Fortuna River Lodge Conference Center. The Fortuna River Lodge is located in Fortuna, California at the following street address:

1800 Riverwalk Drive
Fortuna, California 95540

2. Project Location and Setting

The Ocean Ranch Unit (ORU) of the Eel River Wildlife Area is located north of the mouth of the Eel River and northwest of the town of Loleta in Humboldt County, California. The ORU encompasses approximately 933-acres (378-hectares) and is generally bounded by the Pacific Ocean to the west, Table Bluff to the north, McNulty Slough to the east and North Bay to the south. The ORU, which is part of the approximately 2,600-acre (1,052-hectare) Eel River Wildlife Area (ERWA), is owned and managed by the CDFW as fish and wildlife habitat and public recreational uses. The Project Area described in this NOP includes all portions of the ORU where restoration and construction activities are proposed under the Project. Figure 1 Project Vicinity (Figure 1) depicts the Project Area and vicinity.

Historically, much of the area that is now the ORU was estuarine tidal marsh. Sometime between 1916 and 1948, the saltmarsh portion of the ORU (herein referred to as “Ocean Ranch”) was diked, isolated from tidal waters, and drained for pasture through tide gates to McNulty Slough. In 1968, Ocean Ranch was acquired by CDFW with Wildlife Conservation Board coastal wetland acquisition funds. Ocean Ranch was subsequently subdivided by CDFW into five distinct areas using earthen dikes. The five subdivided areas, defined as Areas A through E, were managed as shallow freshwater habitat for waterfowl and other native wildlife.

The ORU also encompasses portions of the coastal dunes that separate Ocean Ranch from the Pacific Ocean to the west. Significant areas within the dunes are dominated by invasive European beachgrass (*Ammophila arenaria*), which established on the north spit of the Eel River in the 1970’s. The prevalence and density of European beachgrass in the coastal dunes affects the ability for native plants to establish and limits dune function, including sand movement. Figure 2 Project Area (Figure 2), located in Appendix A, depicts Areas A through E of the ORU, as well as the coastal dunes portion of the Project Area targeted for European beachgrass eradication. The existing conditions in Areas A through E and the coastal dunes are described below.

2.1 Area A

Area A comprises approximately 306 acres of tidal wetlands. Area A is connected to McNulty Slough through a large breach along its eastern boundary. Three main channels drain the site. One of the three channels consists of a constructed ditch that runs along the inside of the levee system. It is likely that this channel was a “borrow ditch” from which material was excavated to improve the perimeter levee and counteract loss of elevation from settlement and for maintenance. Area A is well connected to the tides and is predominately exposed salt marsh with interspersed mudflats at low tide. Brackish marsh is present in the northern reaches of Area A near Area E. A fresh water seep is located within Area A along its southwest corner just inside of the perimeter levee. This seep is isolated by an earthen berm with dimensions similar to the perimeter levee and has formed a pond approximately 0.33 acres in size.

2.2 Area B

Area B encompasses approximately 111 acres of both remnant tidal channels and linear ditches. Area B has subsided over the last 70 years on the order of one to two feet, likely from agricultural activities in the 1940s. Area B has been managed in the past as seasonal freshwater wetlands; however a 48-inch diameter water control structure has failed, having lost its tide gate. The water control structure is now functioning as an open culvert instead of a drain, and tide water enters Area B during high tides. Currently, Area B is functioning as a muted tidal basin. In general, water elevations are shallow throughout the unit with depths around one to two feet at high tide and deeper where a historic channel is present. The tidal influence causes water levels to fluctuate throughout the day, typically within a range of one foot or less. The area has converted to a brackish marsh which is evidenced by a shift in vegetation types.

2.3 Area C

Area C consists of approximately 40 acres of remnant tidal channels and managed freshwater wetlands, and similar to Area B, has subsided one to two feet. A water control structure connects Area C to Area B and allows a small amount of water exchange between the two areas. A borrow ditch parallels the perimeter levee for most of its length and, as with Area B, elevations are on average lower than those in Area A. Area C is bound on the north by Table Bluff with the upland slope having at least two springs/seeps which have created riparian zones adjacent to the Area C wetlands.

2.4 Area D

Area D, consisting of approximately five acres, is isolated from Area C by an internal levee. Area D consists of a brackish tidal marsh connected to McNulty Slough by two small open culverts. The tide range within Area D is highly muted due to constriction caused by existing culverts.

2.5 Area E

Area E, consisting of approximately 13 acres, is a managed freshwater wetland separated from Area A by a levee. A large freshwater spring on Table Bluff delivers a significant amount of freshwater to this unit. Water levels are controlled by a single flashboard weir that drains to Area A. A portion of this wetland is covered by willows and other woody vegetation.

2.6 Coastal Dunes

The coastal dunes within the Project Area encompass approximately 330-acres and extend along about 3-miles of shoreline (Figure 2). The densest stands of European beachgrass (mapped in 2015 as having 61% to 100% cover) are located along the northern 2.6 miles of the Project Area; beachgrass within the southern portion of the Project Area is mapped as having less than 61% cover. Dune mat and associated native plants species, including the federal and state endangered beach layia (*Layia carnosa*) are found within the coastal dunes, but are limited (or non-existent) in areas where dense stands of beachgrass have established.

2.7 Surrounding Land Uses

The Humboldt Bay National Wildlife Refuge, Table Bluff County Park, and Table Bluff Ecological Reserve lie to the north of ORU. A cluster of residential parcels associated with the Weott Rancheria borders Area D at the northeast portion of the Project Area. The Pacific Ocean borders the western portion of the Project Area. State lands and tidal sloughs are located to the south and east of the Project Area. Private agricultural lands are generally located east of the Project Area.

2.8 Existing Infrastructure

The Project Area can be accessed from two locations off of Table Bluff Road. A single lane graveled interior road extends south from Table Bluff Road for approximately 0.5 miles to a barn and associated corrals/loading chutes. A flat, stable pad is found at this location which was the site of previous dairy operations. The second access is Sand Dune Road which runs south from South Jetty Road and passes just inside the dune line from Table Bluff County Park. This road is primarily sand and extends all the way to the mouth of the Eel River.

2.9 Site Physical Characteristics

2.9.1 Geology and Soils

Ocean Ranch and the rest of the Eel River estuary is an alluvial valley in the Coast Range of Northern California. The native soils are primarily dark gray, stiff clayey silt underlain by unconsolidated Holocene to Pleistocene fluvial and flood plain deposits, consisting of sand, silt, and gravel (LACO 2014).

The Project Area is within a seismically active region, which is subject to frequent moderate to large earthquakes. The Eel River Valley is a broad northwest-southeast trending syncline formed by compression tectonics. Although not located within a "Fault Rupture Hazard Zone" (Bryant and Hart 2007), or within an area currently

designated as a “Seismic Hazard Zone” by the State of California (State), numerous faults of various activity levels are located within 30 miles of the Project Area.

2.9.2 Invasive Plants

The natural plant communities within the ORU have been highly altered in many areas by invasive plant infestations. Years of dairy farm operations, cattle grazing, and other disturbance regimes have facilitated the establishment and dominance of non-native and invasive species. Areas A and D have large dense stands of dense-flowered cordgrass (*Spartina densiflora*) that form vegetation monocultures and exclude native plants. Areas B, C, and E have more native plant diversity with smaller patches of dense-flowered cordgrass.

European beachgrass is a highly invasive species that is widespread in coastal dunes throughout the west coast of the United States. As with dense-flowered cordgrass, this species forms dense monoculture stands and has the ability to displace entire native plant communities. As noted above, it is prevalent within the dunes along the western boundary of the Project Area where it has displaced native dune mat habitat and continues to invade and increase in cover.

2.9.3 Special-Status Species

Numerous state-listed, federally-listed, and/or sensitive species and natural communities (e.g., state animal Species of Special Concern, and plants or communities with State Rank 1 to 3) are found in the Eel River Watershed. Some of these sensitive species and natural communities are known to occur, or have the potential to occur within the Project Area. In 2008 and 2009, CDFW conducted fish monitoring and water quality sampling in McNulty Slough. The monitoring goals were to determine the presence of juvenile salmonids in McNulty Slough and/or within the ORU; to determine the presence of other estuarine aquatic species in the ORU; and to provide baseline data to evaluate the feasibility and success of future habitat restoration. The 2008 and 2009 monitoring documented numerous listed fish species within McNulty Slough, including Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead trout (*O. mykiss*), and longfin smelt (*Spirinchus thaleichthys*) outside the ORU boundary; however, none of these salmonid species were found within ORU. Following the completion of the 2008 and 2009 monitoring, CDFW conducted fish monitoring in 2012 to determine whether or not the tidewater goby (*Eucyclogobius newberryi*) was present within the ORU. Tidewater gobies were documented within ORU during the 2012 monitoring, with the highest quantities documented in the north end of Area A and south end of Area E. Green sturgeon (*Acipenser medirostris*) are also known to the project vicinity.

Rare plants observed in the Project Area during surveys conducted between 2014-2017 include seacoast angelica (*Angelica lucida*), Lyngbye's sedge (*Carex lyngbyei*), Humboldt Bay owl's-clover (*Castilleja ambigua* ssp. *humboldtiensis*), Point Reyes salty birds-beak (*Chloropyron maritimum* ssp. *palustre*), dark-eyed gilia (*Gilia millefoliata*), and beach layia, as well as natural communities of Coastal Brackish Marsh, Northern Coastal Salt Marsh, and Active Coastal Dunes.

Western snowy plover are also known to the coastal dunes within the Project Area.

2.9.4 Watershed

The Eel River watershed encompasses over 3,684 square miles and drains a rugged area spanning five counties within the Coast Range of California. The soils of the Eel River drainage basin are highly friable and susceptible to erosion, especially given the basin's steep geography and intense rainfall.

2.9.5 Hydrology

The Eel River discharges an average of 9,500 cubic feet of water per second (cfs) annually with peak discharges occurring during the winter months and periods of high rainfall. The drainage basin of the Eel River is uniquely situated to receive copious amounts of rainfall during atmospheric river events. These large rainfall events, combined with steep terrain and a large watershed drainage basin, produce flash flood conditions where river discharges can increase from less than 1,000 cfs to upwards of 250,000 cfs within 24 to 48 hours. The maximum river flow was recorded in December 1964 with an estimated flow of 936,000 cfs, the highest recorded in California. During flood events water levels will be elevated within the ORU on the order of one to five feet and will typically return to normal after one to two days.

The Eel River estuary is a bar built estuary. These estuaries occur around the mouths of rivers with extended periods of low flow where ocean waves and currents can form sand bars that significantly restrict the size of the mouth. The size and location of the mouth vary with a process that is driven by high river flows prevalent during the winter months. The estuary is classified as intermittent, which means the salinity profile within the estuary varies dramatically, ranging from a salt wedge to partially mixed, and is dependent upon the amount of freshwater flowing from the Eel River.

The Eel River estuary is tidally dominated and, as a result, water throughout the estuary is brackish, continually ranging in salinity from fresh to saltwater (from 0 to approximately 35 parts per thousand). Mixed semidiurnal tides bring saltwater from the ocean into the estuary and associated sloughs. Tidal influence extends up the Eel River and is generally considered to reach Fernbridge, a river crossing approximately 7.5 miles upstream from the mouth of the Eel River.

2.10 Land Use, Zoning and Williamson Act

The parcels comprising the Project Area are owned by the State of California. As all Project Area parcels are state-owned, local zoning and general plan designations do not apply to the Project. The following section provides a zoning and land use designation summary for general reference; however, implementation of the Project on state-owned lands would not require land use review or permitting by Humboldt County.

The General Plan land use designation for the Project Area is Agriculture Exclusive (AE) with the exception of the northernmost parcel, which is designated as Commercial Recreation (CR) (County of Humboldt 2017). Principal uses allowed by the County for AE parcels are limited to the production of food, fiber or plants, with residence as a use incidental to this activity. Principal uses within CR designated

parcels include: commercial recreation facilities, accommodations, and recreation/tourist tourist-oriented sales and services geared to local and visitor needs (County of Humboldt 2017).

Zoning for the AE-designated parcels within the Project Area is AE-60 with the combining zones of Archaeological Resource Area Outside Shelter Cove (A), Coastal Wetland Areas (W), Flood Hazard Areas (F), Streams and Riparian Corridor Protection (R), and Transitional Agricultural Lands (T)., which is consistent with the land use designation (County of Humboldt 2000). Zoning for the CR-designated parcel is CR/B, including a combining zone of Beach and Dune Areas (B) (County of Humboldt 2000).

No portion of the Project Area is enrolled in a Williamson Act contract. Parcels to the east, outside of the Project Area boundary, are under Williamson Act contract (County of Humboldt 2018).

3. Project Description

3.1 Project Goals and Objectives

The goals of the Project are:

1. To restore and expand natural estuarine function in the restoration area, and to assist in recovery and enhancement of habitat for native fish, invertebrates, wildlife and plant species.
2. To restore natural dune function, and to assist in recovery and enhancement of habitat for native species, state and federally-listed or otherwise sensitive plants, and associated natural communities.

3.2 Overall Project Concept

The Project would include restoration and enhancement of tidal estuarine and coastal dune habitats within an 805-acre (326-hectare) restoration area. Restoration and expansion of estuarine functions would be accomplished by implementing actions that increase the tidal prism, improve connectivity between the restoration area, McNulty Slough and North Bay, increase habitat complexity, and control non-native plant species.

Restoration of a portion of the ORU to tidal marsh would reduce the long-term maintenance obligations associated with ongoing management of existing infrastructure, while addressing a critical regional need for enhancement and restoration of tidal estuarine habitats both regionally and within the Eel River estuary. Enhancement of dune functions would be accomplished by eradication of invasive species, primarily European beachgrass, and reestablishment of native dune mat natural communities.

Tidal restoration activities contemplated under the Project include:

1. Breach external and internal levees
2. Lower portions of the external levee along McNulty Slough

3. Remove portions of internal levees
4. Excavate tidal channels
5. Create transitional high marsh habitat
6. Construct habitat ridges
7. Install ditch plugs and fill internal ditches
8. Install large wood habitat structures

Invasive species management activities would include: controlling dense-flowered cordgrass with mowing, grinding, excavation, burning, and/or chemical control; controlling dwarf eelgrass using mechanical excavation and smothering; and eradicating European beachgrass using manual, mechanical, burning and/or chemical control methods. Public access improvements would include improving the access road into the restoration area, improving the existing parking area, constructing a new parking area, installing a kayak put-in, and establishing a trail system.

3.3 Proposed Project Activities

The location of the proposed Project design elements, as described in the following subsections, are illustrated on Figure 3 Restoration Project Design Elements (Figure 3) located in Appendix A.

3.3.1 Levee Breaches

The Project would construct four new external levee breaches, identified as BR-1 through BR-4, to connect the ORU to North Bay and McNulty Slough. Breach BR-1 would connect Area A to North Bay downstream of the McNulty Slough and Hawk Slough confluence. Breaches BR-2, BR-3, and BR-4 would connect Areas B, C and D, respectively, directly to McNulty Slough at historic slough locations. Areas A, B, C, and E would be interconnected through four internal levee breaches, noted as BI-1 through BI-4. The location of levee breaches are shown on Figure 3 (Appendix A).

3.3.2 Tidal Channels

Up to 8,520 linear feet (2,597 meters) of new tidal channels would be excavated in Areas A, B, C, and E, beginning at BR-1 and extending south to North Bay. A new channel would be excavated south from BR-1, connecting Area A to North Bay. The length of the new channel would be approximately 860 linear feet (262 meters). Similarly, a 2,390-foot (728-meter) long channel would be excavated north from BR-1 to facilitate water conveyance into the lower reaches of Area A. A portion of a remnant slough channel in Area B would be enlarged to connect BR-2 to the northern reaches of Area A and subsequently Area E. A tidal channel would also be extended from BR-3 through Area C to connect to McNulty Slough.

3.3.3 Levee Lowering/Removal

Sections of the perimeter levee along the east side of Areas A, B, C and D would either be left intact, or altered. Sections of the perimeter levee left intact would be

used to maintain upland refugia and roosting habitat for wildlife and provide wave refraction during flood events. Altered perimeter levees would be either lowered to a crest elevation (referenced hereinafter to vertical datum NAVD 88) of eight feet, or lowered to marsh plain elevation. Portions lowered to a crest elevation of eight feet would be recontoured with varying flat, gradual slopes to provide transitional habitat. Large wood may be placed along some sections of lowered levee to provide high tide refugia for wildlife and a break from wind generated waves coming from the west. Sections of levee lowered to marsh plain elevation would be used to increase tidal exchange. Internal levees between Areas B, C, and D would be removed, including a part of the internal levee separating Areas A and B, to improve tidal exchange and water quality.

3.3.4 High Marsh Elevation Fill

Material excavated to create the tidal channel from BR-1 to North Bay and through the lower portion of Area A may be used to create higher elevation marsh habitat in Area B. Higher marsh elevations may also provide resiliency to sea level rise over time. Alternatively, if the cost or feasibility of moving excavated soils from Area A to Area B is prohibitive, excavated material may be relocated to the west side of Area A and/or placed as habitat ridges adjacent to the new tidal channel within Area A.

3.3.5 Habitat Ridges

Habitat ridges are un-engineered spoil piles that are placed along the outside meander of newly constructed channels to guide channel formation and facilitate revegetation. Habitat ridges would be placed along the new tidal channel in Area B, constructed to a crest elevation of approximately seven feet, at approximately the level of mean higher high water (MHHW), and allowed to develop as high marsh vegetation.

3.3.6 Ditch Block and Ditch Fill

A ditch block is a small plug constructed of compacted earthen fill that is used to block the path of water, help guide natural channel formation, and accelerate accretion of sediment in isolated portions of a ditch. Ditch blocks would be installed at strategic locations in several borrow ditches in Area A and Area B. Some ditches would also be filled to facilitate channel formation.

3.3.7 Placement of Large Wood

Large wood would be placed in Areas A, B and C to increase habitat complexity in tidal channels. Logs would be embedded into the channel bank and pinned to limit movement. Large wood would also be installed along the lowered sections of the perimeter levee of McNulty Slough to increase habitat complexity and provide wave attenuation.

3.3.8 Beneficial Reuse of Excavated Sediments

All soil excavated to construct the tidal estuary restoration project elements, including soil excavated during levee breaching, levee lowering, and tidal channel

excavation, would be reused onsite. Proposed onsite soil reuses include: creating high marsh habitat, filling internal ditches and lower elevation areas, installing ditch plugs, and repairing damaged levees and berms not proposed for removal. Excess soil not used for one of the above Project components may be spread as a thin layer (less than six-inches [15-centimeters] deep) in lower elevation saltmarsh.

In all instances, excavated soil reused onsite would be placed at an elevation to ensure wetland habitat characteristics persist (i.e., mudflats or saltmarsh would be converted to higher elevation estuarine marsh, not to upland). No fill material would be imported to the restoration area.

3.3.9 Invasive Species Management

Dense-Flowered Cordgrass Management

Under the Project, up to 326 acres (132 hectares) of cordgrass would be treated after the tidal restoration project is complete using one or more of the methods described in the following subsections. The methods utilized to control cordgrass would be carried out using a comprehensive integrated pest management program comprised of a series of treatments implemented over time based on seasonality, weather, tides, and labor availability.

Dense-flowered cordgrass treatment methods would include one or more of the following methods: top mowing, grinding, tilling, excavation, flaming, prescribed burning, and/or chemical control. In general, treatments would occur between February 1 and March 15, or after August 1, to avoid the nesting bird season. It is anticipated that the first treatment of cordgrass would occur after implementation of the tidal restoration project has been completed.

Dwarf Eelgrass Management

Under the Project, if observed during ongoing eelgrass surveys of McNulty Slough, dwarf eelgrass would be removed using mechanical control or smothering. Control of dwarf eelgrass would occur, if observed, on the Ocean Ranch side (west side) of McNulty Slough, from the edge of the perimeter levee to mean low water. Control of dwarf eelgrass is not proposed along the eastern portion of the slough. Control of dwarf eelgrass would likely occur between June and August, concurrent with eelgrass surveys timed to correlate with the flowering period of the species.

Dwarf eelgrass treatment methods would include manual removal and/or smothering (i.e., covering stands with burlap and clean mud).

European Beachgrass Management

Under the Project, up to 232 acres (94 hectares) of beachgrass would be removed from the restoration area. Management efforts would be concentrated in an area defined as the “Primary Treatment Area”. The Primary Treatment Area would extend along approximately 2.6 miles (4.2 kilometers) of shoreline and generally correspond with the 155 acres (63 hectares) where the densest stands of beachgrass (61 percent to 100 percent cover) are located. Removal of beachgrass from a supplemental area, defined as the “Secondary Treatment Area”, would occur in coordination with USFWS to ensure impacts to western snowy plover are minimized.

The Secondary Treatment Area would include an 0.3 miles (0.5 kilometers) of shoreline along the southern portion of the restoration area and generally encompasses 77 acres (31 hectares).

Removal of beachgrass within the restoration area would be phased temporally and spatially to reduce edge effects and provide natural communities time to re-establish and ameliorate susceptibility to foredune erosion. In general, beachgrass treatments in both treatment areas would occur between February 1 and March 15, or after August 1, to avoid the nesting bird season.

Treatment methods would include one or more of the following: manual removal, mechanical removal, burning, and/or chemical control. Treatment methods would generally be used in combination, meaning that a treatment area may be initially burned to remove thatch, followed by an herbicide application to kill rhizomes, with remaining plants manually removed or chemically treated if they re-sprout after initial treatments.

3.4 Public Access Improvements

The Project would include improvements to an existing access road and parking area, construction of a new parking area, construction of a pedestrian trail system, and construction of a kayak put-in. These improvements would be designed and located to be wildlife-friendly, with some uses prohibited or seasonally restricted to minimize impacts to wildlife.

A 0.5-mile (0.8-kilometer) segment of the modified levee separating Areas A and B would be managed as a pedestrian trail, extending from the new parking area to the levee breach between Areas A and B. A second 0.25-mile (0.4-kilometer) trail would extend from the new parking area to Sand Dune Road, utilizing the modified levee between Areas A and E. This trail would provide access between the restoration area and the Pacific Ocean. Construction of the trail system would include a bridge crossing having a span of about 50 feet (15 meters) over the BI-3 breach, as well as a box culvert crossing at BI-4.

Under the Project, the existing parking area at the north end of Table Bluff Road and the existing gravel access road would be improved, including grading and resurfacing. A new parking area would be established near the south end of the access road to accommodate vehicle parking in association with the proposed pedestrian trail system. A kiosk and interpretive display would be located in the parking area. A second kiosk and interpretive display would be installed at the entrance to the sand road off of South Jetty Road.

A kayak put-in would be constructed in Area B near the new parking area and pedestrian trail system. The launch would provide kayakers with water access during most tides and would connect to the tidal channel system in Area B.

3.5 Project Implementation

Primary access to the restoration area during construction of the tidal restoration project would be from the existing single-lane gravel road on the north end of the ORU. Construction equipment would be staged in the existing improved parking area on the north side of the restoration area, as well as in the adjacent uplands north of

the tidal restoration area. Construction equipment would access individual work sites from the top of existing levees and berms, where possible, and along the sand road, where necessary. Low-ground pressure equipment, and/or equipment staged from barges, would be used in discrete restoration areas that are not accessible from existing levees or berms. Construction equipment would not be stored in or near water or inundation areas.

Vegetation management under the Project would utilize the same access roads and parking areas as those described for the tidal restoration component of the project. All areas disturbed by temporary staging and access would be de-compacted and naturalized as needed prior to Project completion.

Tidal restoration project construction would be phased into two construction seasons based on available funding and sequencing earthwork. Construction work may occur year-round, if feasible, but would likely occur primarily between May and October. Construction is currently anticipated for years 2019 and 2020. Initial phases of construction would include isolating Areas B, C and D and constructing interior site elements, such as channel excavation, habitat ridges, and ditch blocks. Public access elements would likely be implemented concurrent with the interior site work. Subsequent phases would include excavation of the BR-1 breach and channel to North Bay, followed by breaching and lowering levees throughout the remainder of the site.

4. Probable Environmental Effects

Per CEQA Guidelines Section 15082 (a)(1)(c), the probable environmental effects of the Project, are summarized below based on a preliminary review of the Project. Probable environmental effects are organized by the environmental resource categories identified in Appendix G of the CEQA Guidelines. Because there is the potential for significant impacts to occur as a result of the Project, even with the use of mitigation measures, CDFW has determined that an EIR will be prepared. The EIR will provide site specific information and analysis relevant to the Project; evaluate Project alternatives; and will identify mitigation measures where significant impacts are identified.

For the reasons described below, CDFW does not anticipate the Project will have any impact on three environmental resource categories: Mineral Resources, Population and Housing, and Public Services. These resource categories will not be analyzed in the EIR unless input from responsible agencies, trustee agencies, or the public during the scoping period indicate an analysis is warranted.

4.1 Aesthetics

Would the project:

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

The Project Area is in a highly scenic area and includes coastal dunes, riparian woodlands, tidal mudflats, tidal slough channels, salt marshes, and freshwater marshes. Project activities are not anticipated to substantially degrade scenic resources in the Project Area, rather they are intended to restore and expand natural estuarine and dune functions, including the recovery and enhancement of native species (estuarine fish, invertebrates, wildlife, and plants) and their habitats and provide public access. However, the EIR will analyze the potential impacts to aesthetic resources, and if appropriate, include feasible mitigation measures.

4.2 Agricultural and Forestry Resources

Would the project:

- a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?
- b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?
- c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?
- d) Result in the loss of forest land or conversion of forest land to non-forest use?
- e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

Agriculture began on the prairies of Table Bluff around 1850. Sometime between 1916 and 1948, the Ocean Ranch site was diked, isolated from tidal waters and drained for pasture through tide gates to McNulty Slough. Historical use consisted primarily of livestock grazing and dairy farming, although imagery from 1948 shows

that some areas of Ocean Ranch were actively farmed for agriculture. Active farm practices on Ocean Ranch ceased when it was acquired by CDFW in 1968, to be managed as a Wildlife Area.

No project site parcels are under Williamson Act contract, however there are Williamson Act parcels located east of the Project Area (County of Humboldt 2018). According to the United States Department of Agriculture, Natural Resources Conservation Service (NRCS) Web Soil Survey, the majority of the ORU is located on soils that are not designated as prime farmland. The only exception is the Weott soil unit, which is prime farmland if irrigated. Although, irrigated or non-irrigated, this soil has a 5w capability class designation, which typically is not considered prime as defined by the Local Coastal Program (LCP) or the Coastal Act. Weott soils are found in a small north-south band within Area A of the ORU and most likely are much saltier than depicted in the current NRCS mapping unit.

The EIR will analyze the potential effects to agricultural resources from implementation of the Project and include feasible mitigation measures, if needed, to reduce any potentially significant impacts to a less than significant level. The Project Area does not include any forest land or land zoned timberland. A Land Evaluation Site Assessment (LESA) will be prepared to aid in the analysis of agricultural resources impacts and be included as an Appendix in the DEIR.

4.3 Air Quality

Would the project:
a) Conflict with or obstruct implementation of the applicable air quality plan?
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?
c) Result in a cumulatively considerable net increase in 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)?
d) Expose sensitive receptors to substantial pollutant concentrations?
e) Create objectionable odors affecting a substantial number of people?

The Project Area is located within the North Coast Air Basin (NCAB), which is under the jurisdiction of the North Coast Unified Air Quality Management District (NCUAQMD). The NCAB is currently in attainment (or is unclassified) for all state and federal ambient air quality standards, with the exception of the state standard for particulate matter less than ten micrometers in diameter (PM₁₀). The EIR will discuss temporary air quality impacts from construction of the Project (e.g., equipment and vehicle exhaust emissions) and restoration activities, including invasive species management activities (e.g., controlled burning). The EIR will also discuss the Project's conformity with applicable air quality plans and exposure of sensitive receptors to criteria air pollutants and odors. Mitigation measures for significant impacts will be included where applicable and feasible.

4.4 Biological Resources

Would the project:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?
- c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?
- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The Project Area includes wetlands, riparian areas, coastal dunes and uplands that support a diverse array of aquatic and terrestrial biological resources. The EIR will utilize a number of special studies in the preparation of this section, including a site-specific wetland delineation, rare plant assessment and sensitive plant surveys, natural community map and report, invasive plant map and report, and fish assemblage surveys, among others. The EIR will analyze potential impacts to special status-species, wetlands, riparian habitat, and coastal dunes and will include feasible mitigation measures if significant impacts are identified. The EIR will also discuss the Project's conformity with other federal and state policies and plans protecting biological resources.

4.5 Cultural Resources

Would the project:

- a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?
- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?
- c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?
- d) Disturb any human remains, including those interred outside of formal cemeteries?

A Cultural Resources Investigation is being prepared to inventory cultural resources in the Project Area, and to assess potential impacts on these resources from Project activities. Potential impacts could include the destruction of known or unknown cultural resources. The EIR will include the results from this investigation and identify mitigation measures if significant impacts would occur.

4.6 Geology & Soils

Would the project:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
 - ii) Strong seismic ground shaking?
 - iii) Seismic related ground failure, including liquefaction?
 - iv) Landslides?
- b) Result in substantial soil erosion or the loss of topsoil?
- c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on, or off, site landslide, lateral spreading, subsidence, liquefaction or collapse?
- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?
- e) 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?

Geologic and soils issues include potential erosion, loss of topsoil, and sedimentation during and after construction due to proposed grading, dredging, channel reconfiguration, and levee reconfiguration, as well as changes in sand movement associated with removal of European beachgrass from the coastal dunes. The EIR will describe the site's existing geologic conditions and soils based on existing information and technical reports prepared for the Project. The EIR will include an analysis of the geology of the site as it relates to slope stability, earthquake hazards, landslides, and other potential geologic hazards, and recommend appropriate mitigation measures if significant impacts are identified.

4.7 Greenhouse Gas Emissions

Would the project:

- a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The EIR will evaluate climate change and sea level rise projections and the potential effects of those projections on the proposed Project, as well as any potential effects the Project may have on sea level rise or greenhouse gas (GHG) emissions. Potential GHG emissions resulting from the Project would also be estimated and quantified using CalEEMod emissions modeling software. The NCUAQMD has not adopted a threshold for construction-related GHG emissions against which to evaluate significance and has not established construction-generated criteria air pollutant screening levels above which quantitative air quality emissions would be required; however, this potential impact will be further discussed in the EIR.

4.8 Hazards & Hazardous Materials

Would the project:

- a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?
- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?
- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?
- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Would the project:

- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?
- f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?
- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?
- h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

The EIR will discuss potential hazards in the Project Area, identify appropriate spill prevention measures, identify potential impacts to construction workers and recreation users due to potential soil contamination and other potential hazards at the site. Phase I and II Environmental Site Assessments were not completed for the Project and are not assumed to be needed; however, a database search through Environmental Data Resources, Inc. (EDR) will be conducted to access the California Department of Toxic Substances Control (DTSC) Cortese List, and to assess the proximity of known contaminated sites to the Project Area. This information will be used in the analysis and appropriate mitigation measures incorporated if significant impacts are identified.

4.9 Hydrology & Water Quality

Would the project:

- a) Violate any water quality standards or waste discharge requirements?
- b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off- site?
- d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?

Would the project:

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

f) Otherwise substantially degrade water quality?

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

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

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

j) Inundation by seiche, tsunami, or mudflow?

The Project could affect water quality through the release of contaminants and sediment from construction activities. The Project could also alter hydrodynamic processes, which control local salinity levels, or increase turbidity during and after construction, adversely affecting water quality. In addition, flows in McNulty Slough are likely to change with the increased tidal prism following restoration; these increased flows could affect water quality, erosion along this waterway, and fisheries use of this waterway. The EIR will discuss these issues and potential effects and incorporate mitigation measure if significant impacts are identified.

4.10 Land Use & Planning

Would the project:

a) Physically divide an established community?

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

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

The Project is within the Coastal Zone and will require a Coastal Development Permit or Federal Consistency Determination from the California Coastal Commission per the California Coastal Act and Coastal Zone Management Act. The EIR will describe existing land uses in the Project Area, assess Project impacts and identify any potential land use conflicts. The EIR will summarize applicable goals and policies and assess the Project's consistency with the Eel River Area Plan and the Coastal Act. As noted above, because the Project would be located solely within state-owned lands, local land use and zoning review by Humboldt County is not required.

4.11 Mineral Resources

Would the project:

- a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
- b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

There are no existing mining operations in the Project Area. The Project Area is primarily comprised of fine silt, sand and water, and contains no known mineral resources available for extraction. There are no Surface Mining and Reclamation Act (SMARA)-designated parcels located within the Project Area. Although Humboldt County has not yet been included in the California Mineral Land Classification System by the State Mining & Geology Board (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. Therefore, the Project is not anticipated to result in a loss of mineral resources.

4.12 Noise

Would the project:

- a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?
- b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?
- c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?
- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?
- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?
- f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Noise levels would increase temporarily during construction activities at the Project Area. The EIR will describe the existing noise levels in the Project Area and identify any noise sensitive receptors in the Project vicinity. The EIR will evaluate the potential for temporary noise impacts from construction. Future noise levels will be compared to existing noise levels and applicable noise standards to determine if the

Project will cause a significant increase in ambient noise levels. Appropriate mitigation measures will be incorporated if significant impacts are identified.

4.13 Population & Housing

Would the project:
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The proposed Project would not add any new homes or businesses, nor extend any roads or other infrastructure on the site. The Project would not displace any housing or people, on or adjacent to the site. No aspect of the Project would induce substantial population growth or displace substantial numbers of housing or people. Therefore, the Project is not anticipated to impact population and housing.

4.14 Public Services

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

The Project would not directly increase population, therefore, it is not anticipated that the Project would increase the need for public services. The Project would not place additional demands on schools, parks, or other services. The Project does not include the construction of residential or commercial structures, and the Project is not anticipated to result in population growth in the area. Therefore, the Project is not anticipated to impact public services.

4.15 Recreation

Would the project:

- a) 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?
- b) Include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

The Project is not anticipated to place additional demands on recreational facilities, or require recreational facility construction or expansion. The Project would include improvements to the trail system and parking area, construction of a new boat/kayak launch, and the addition of other public access amenities, such as viewing platforms and interpretive signage. The EIR will analyze potential impacts to recreational resources and identify feasible mitigation measures if significant impacts are identified.

4.16 Transportation & Traffic

Would the project:

- a) 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?
- b) 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?
- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?
- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
- e) Result in inadequate emergency access?
- f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The Project would result in increased traffic during construction, which may temporarily decrease the overall performance and safety of local roadways. The Project may also result in increased operational traffic, potentially affecting levels of service on local streets. The EIR will discuss existing and proposed project traffic

volumes and level of service in the Project Area and recommend mitigation measures if significant impacts are identified.

4.17 Tribal Cultural Resources

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or
- b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

Tribal cultural resources are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either included or determined to be eligible for inclusion in the California Register of Historical Resources; or included in a local register of historical resources as defined in subdivision (k) of Section 5020.1; or a resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. The Project may potentially encounter known or as-of-yet unknown archaeological materials during Project-related construction activities. If such resources were to represent “tribal cultural resources” as defined by CEQA, any substantial change to or destruction of such resources would be a significant impact. The EIR will analyze tribal cultural resources per Public Resources Code Section 21080.3.1, and include mitigation measures, if applicable, per Public Resources Code Section 21080.3.2.

4.18 Utilities & Service Systems

Would the project:

- a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?
- b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?
- c) Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Would the project:

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

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

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

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

The Project does not include the construction of facilities (residential, commercial, or industrial) that would place additional long-term demands on public water systems, wastewater systems, or landfills. Landfills may be used for disposal of damaged water control infrastructure removed from the Project Area. The EIR will include information obtained from the County of Humboldt and applicable utility providers regarding any potential constraints, and feasible mitigation measures would be incorporated if significant impacts are identified.

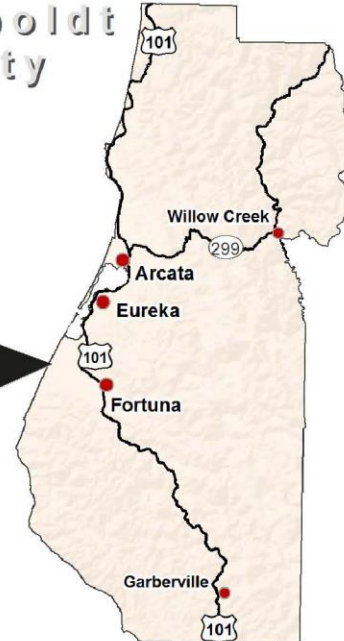
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Appendix A – Figures

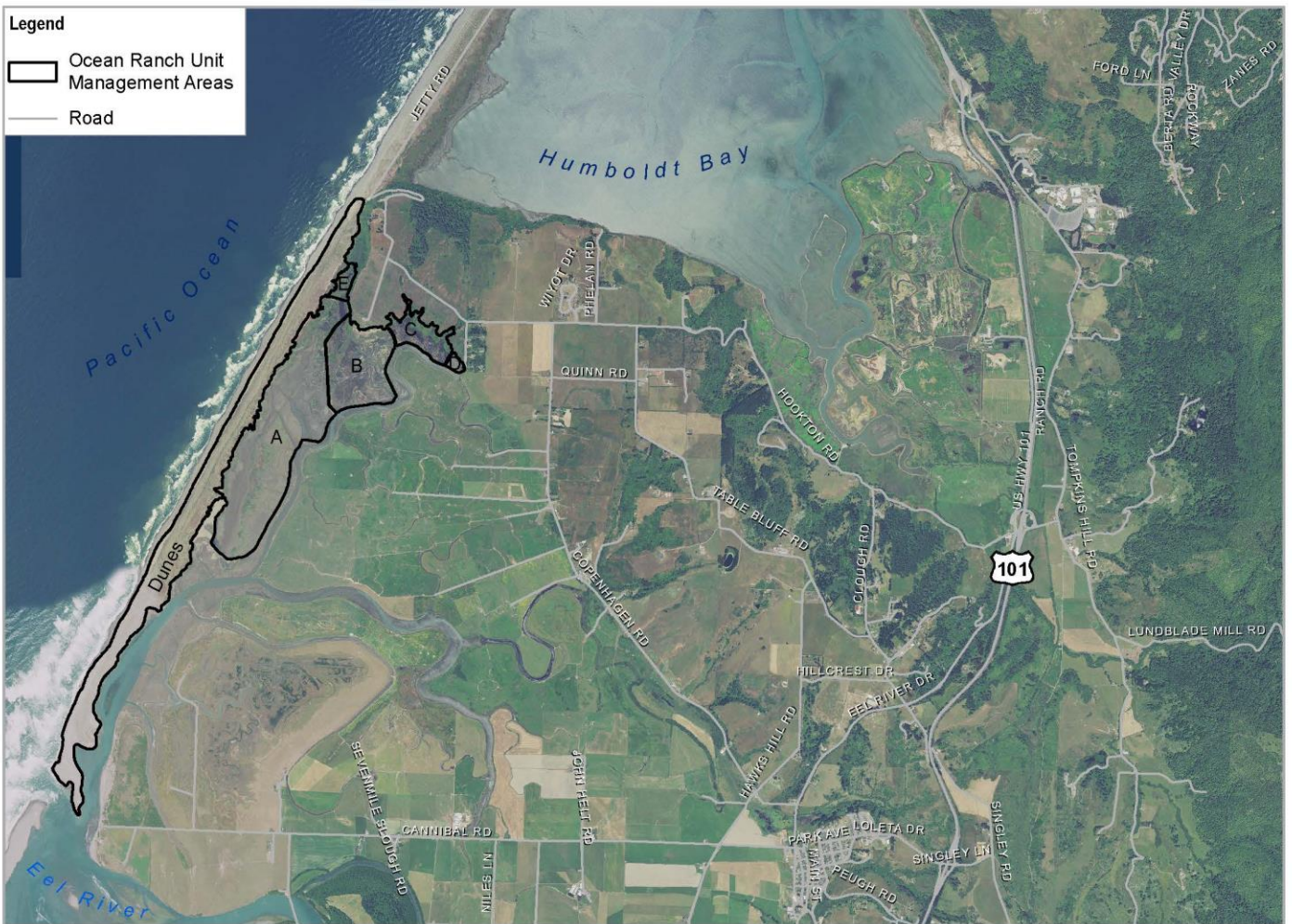


Humboldt County



Legend

- Ocean Ranch Unit Management Areas
- Road



Paper Size 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

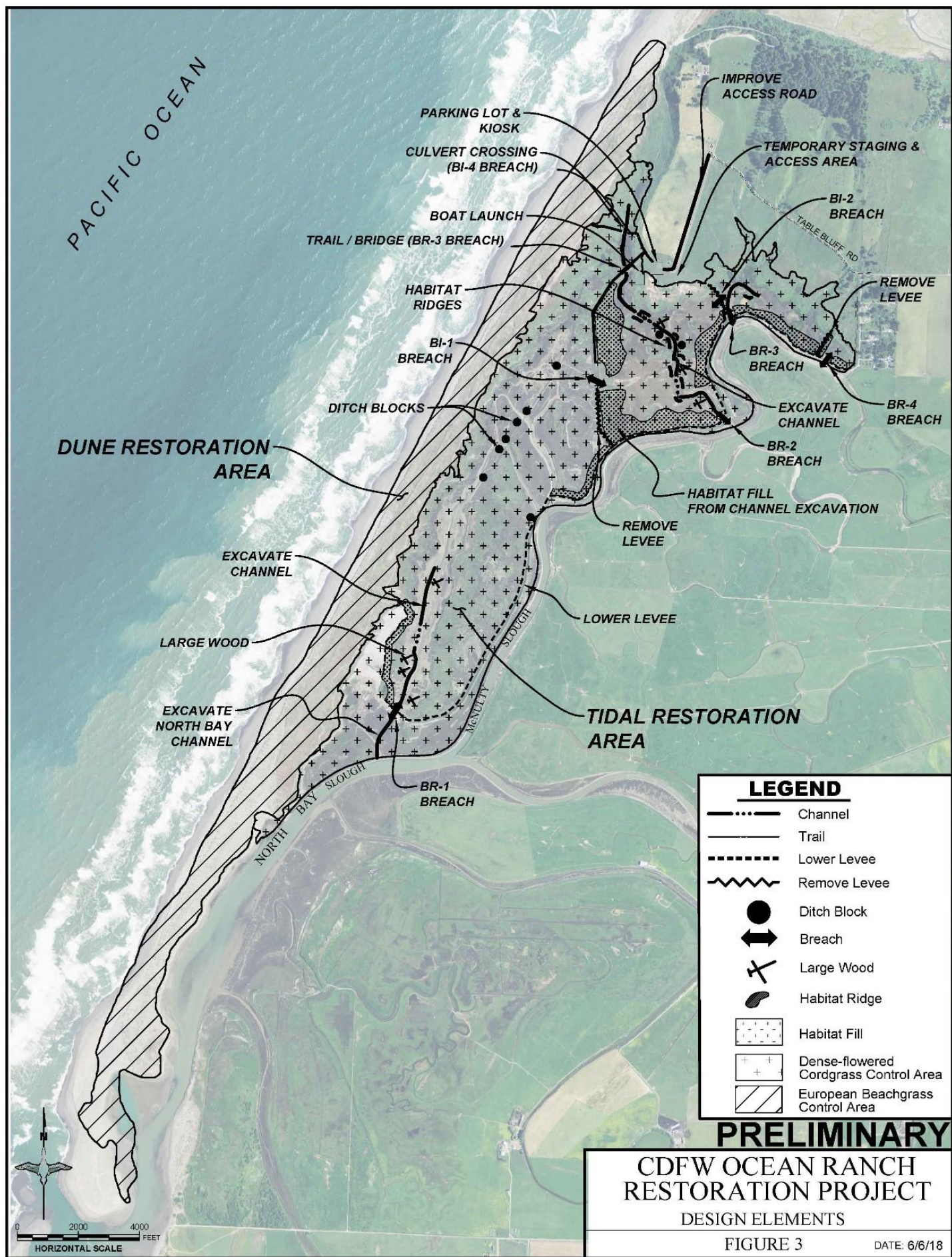
California Department of Fish and Wildlife
Ocean Ranch Restoration Project

Project No. 11152100
Revision No. -
Date 6/11/2018

Vicinity Map

FIGURE 1





Appendix B – Special-status Wildlife Species Accounts

Appendix B – Special-status Wildlife Species Accounts

This section provides species accounts for all special-status species listed in Table 3.4-4 that are present or have a moderate or high potential to occur within the study area of the Ocean Ranch Restoration Project. As defined in Section 3.4 of this Draft EIR, the study area for biological resources includes the Project Area, McNulty Slough and associated levee systems, the first 500 feet (152 meters) of lower Hawk and Sevenmile sloughs, and the entirety of North Bay upstream of its confluence with the Eel River.

A key to the various codes utilized in this section is provided at the end of Appendix B.

Mammals

Townsend's Big-eared Bat (*Corynorhinus townsendii*), CDFW SSC (S2), WBWG High Priority, Moderate Potential

Townsend's Big-eared Bats are medium-sized bats, distinguished from other co-occurring bat species by their large ears and a two-pronged horseshoe-shaped lump on the muzzle. The species occurs throughout the western U.S. and Canada. In California, the species is found throughout the state with the exception of the high elevations in the Sierra Nevada Mountain Range (CDFW 2016). Townsends' Big-eared Bats are typically associated with coastal redwood forests, foothill oak woodlands, inland deserts, pinyon-juniper and pine forests, and mixed coniferous-deciduous forests (Erickson et al. 2002, CDFW 2016). The species roosts colonially in a variety of structures including hollow trees, buildings (barns), mines, and lava tubes. Roost site fidelity is high. Maternity colonies (of females) occur between March and June (CDFW 2016) and males roost singly (Erickson et al. 2002). Females give birth to a single pup per year between May and July. The species winters in mixed sex groups in caves and lava tubes. Townsend's Big-eared Bats feed primarily on moths (Erickson et al. 2002, CDFW 2016).

There are no records of the species from the immediate Project Area. The closest known record is from 2015 at Lanphere Dunes (Weller 2015). Foraging habitat for the species could be present in the Project Area. It is unknown whether the species may roost on the few structures in the Project vicinity and would require surveys to confirm. However, based on historical records and available habitat, the species has a moderate potential to be present and forage around the Project Area.

Hoary Bat (*Lasiurus cinereus*), WBWG Medium Priority, Moderate Potential.

The Hoary Bat is a relatively large bat, brown to rufous in color with a white "frosting" on the fur tips (SDBWG 2004). They are found throughout North, Central and South America but not usually in great densities (SDBWG 2004, NatureServe 2019). The species is found throughout California with the exception of xeric desert habitats in the southeast. The species breeds in inland forest habitat and winters along the coast and in the southern portion of the state. The species engages in seasonal movements which result in sexual segregation during the warmer months (males are found in greater numbers in western portions of the state while the females are more common in the northeast). Hoary Bats migrate between the summer and winter ranges from September through November. Mating occurs during migration or on

the wintering grounds. Females give birth to one to four pups in May through July of the following year (Harris et al. 2008).

Preferred habitat includes a mosaic of forested habitat for roosting and open/edge habitat for foraging. Hoary bats are insectivorous and feed primarily on moths (usually over water or over the forest canopy). The species roosts solitarily in dense tree foliage typically near water (species requires water for drinking) (SBDWG 2004, Harris et al. 2008). Threats to the species include deforestation, wind energy developments (common source of mortality for the species), and reduced prey from over application of pesticides (NatureServe 2019).

There are no records of the species from the immediate Project Area. The closest known record is from 2015 at Lanphere dunes (Weller 2015). Foraging habitat for the species could be present in the Project vicinity. It is unknown whether the species roosts in the Project vicinity (there are no trees in the Project Area that could serve as roosts). Based on available data, the presence of the species in the Project Area 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 and forage around the study area.

Pacific Harbor Seal (*Phoca vitulina richardii*) MMPA Protected Species. High Potential. Known to Occur in Study Area.

The species is found in temperate waters off the coast of North America, from the California/Mexico border to Alaska (NOAA Fisheries 2018a). Pacific Harbor Seals are non-migratory and show strong fidelity to haul-out sites. However, the species will travel to find breeding and foraging sites (Herder 1986, NOAA Fisheries 2018c, NOAA Fisheries 2018b).

Harbor Seals do not reach sexual maturity until three to seven years old. Breeding occurs in the water and pups are born at haul-out sites (NOAA Fisheries 2018d). Haul-out sites are located on the mainland as well as on offshore islands and may include beaches, rocky shores, and intertidal sandbars (NatureServe 2020). The peak haul-out period occurs from May to July in California (NOAA Fisheries 2018c). Pupping season primarily occurs during the spring and summer. Female Harbor Seals raise their pups in large nurseries (NOAA Fisheries 2018d). Harbor Seals feed on a variety of prey items including shellfish, crustaceans, and fish (NOAA Fisheries 2018b). Foraging sites may be located in the open ocean as well as in bays (Ougzin 2013). Along the west coast of the U.S., the Pacific Harbor Seal population is stable or increasing (NOAA Fisheries 2018b).

This species has been observed within McNulty Slough (M. van Hattem pers. comm. 2019). Due to the previous observation and suitable habitat in McNulty Slough and along the beach, there is high potential for this species to be present in the study area.

California Sea Lion (*Zalophus californianus*) MMPA Protected Species. High Potential. Known to Occur in Study Area.

The species is found in the eastern North Pacific Ocean. California Sea Lions generally range from the U.S./Mexico border to Canada, although males may be found foraging during the winter as far north as southern Alaska (NatureServe 2020, NOAA Fisheries 2018b). California Sea Lions are polygynous, with males defending

breeding territories of up to 14 females. Although sea lions reach sexual maturity at four to five years old, males do not defend territories until 9 years of age, when they reach “social” maturity (NOAA Fisheries 2018d). The breeding season occurs in summer and early fall and pups are born in spring and summer the following year (NatureServe 2020, NOAA Fisheries 2018b). The largest breeding colonies are found on offshore islands from the Channel Islands in California south to Baja. California Sea Lions breed on sandy beaches or in rocky coves. They also commonly haul-out on jetties, ocean buoys, and on marina docks (NOAA Fisheries 2018b). California Sea Lions feed at night on a variety of prey including squid and fish (Hawes 1983, NatureServe 2020).

This species has been observed within McNulty Slough (M. van Hattem pers. comm. 2019). Due to the previous observation and suitable habitat in McNulty Slough and along the beach, there is high potential for this species to be present in the study area.

Birds

Great Egret (*Ardea alba*), CDFW Special Animals List (S4), High Potential, Foraging Only. Known to Occur in Study Area.

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. This species favors wetlands, estuaries, lakes, rivers, ponds, streams, marshes, and tidal flats. Great Egrets utilize a variety of substrates for nesting including trees, woody vegetation, or artificial nest platforms. Nests platforms are typically constructed of sticks and vegetation. Great Egrets nest communally 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 (McCrinmon Jr. et al. 2011).

There are numerous records of this species from the study area. The Project Area provides foraging habitat for Great Egrets. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019). However, the lack of large nest trees in the Project Area precludes the chance of breeding onsite. Based on historical records and available habitat, the species has a high potential to be present and forage within the study area.

Great Blue Heron (*Ardea Herodias*), CDFW Special Animals List (S4), High Potential, Foraging Only. Known to Occur in Study Area.

Great Blue Herons are year-round residents in most 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, and wetlands, as well as commercial and residential areas such as golf courses. Nesting habitat includes trees, bushes, or artificial structures. Nests platforms are typically constructed out of sticks and lined with material such as grass, moss, and reeds. Great Blue Herons are colonial nesters 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. Additionally, they are known to scavenge carrion (Vennesland and Butler 2011).

There are numerous records of this species from the study area. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019). The Project Area does contain potential foraging habitat for Great Blue Herons, however the lack of large nest trees in the Project Area restricts the potential for breeding onsite. Based on historical records and available habitat, the species has a high potential to be present and forage within the study area.

Short-eared Owl (*Asio flammeus*), CDFW SSC (S3), High Potential, Foraging Only During Winter. Known to Occur in Study Area.

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 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 CDFW Species of Special Concern, with further research necessary to determine the actual state-wide status of the species. 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).

Short-eared owls are known from wetland and agricultural areas surrounding Humboldt Bay, including the Humboldt Bay National Wildlife Refuge and the Fay Slough and Mad River Slough Wildlife Areas. Nesting is not confirmed for this region, however displaying birds have been observed during the breeding season at the Humboldt Bay National Wildlife Refuge (MRB/PWA 2004). In addition, an adult Short-eared Owl was observed feeding two fledglings at Mad River Slough Wildlife Area in June of 1990 (Harris 196 in Hunter et al. 2005). There are also numerous records of this species from the Project Area during the winter (eBird 2019). Based on historical records and available habitat, the species has a high potential to seasonally be present and forage around the Project Area.

Western Burrowing Owl (*Athene cunicularia*), CDFW SSC (S3), USFWS BCC, High Potential, Foraging Only During Winter.

Western Burrowing Owls are found in many grasslands and arid regions of western North and Central America. In California, Western Burrowing Owls are found year-round south of the San Francisco Bay, with seasonal breeders to north and east of this area. Western Burrowing Owls are declining in many areas as a result of agricultural activities, pesticides, and habitat loss. The species prefers grassland, steppe, and desert habitats and can be found in open/developed landscapes such as golf courses, cemeteries, and airports. Western Burrowing Owls typically nest in burrows created by other animals such as California ground squirrels, badgers, prairie dogs, or skunks. They may also excavate their own burrows or use artificial burrows. Western Burrowing Owls feed on insects, small mammals, reptiles, and amphibians (Poulin et al. 2011).

Western Burrowing Owls are known to winter in the Project vicinity and suitable habitat for the species is present in the Project Area (eBird 2019). Based on available data, the presence of any established breeders at or near the site is unlikely. However, this species has been observed in the study area regularly during the fall/winter (M. van Hattem pers. comm. 2019), and therefore based on historical records and available habitat, the species has a high potential to seasonally be present and seasonally forage around the study area.

Canvasback (*Aythya valisineria*). CDFW Special Animals List (S2), High Potential, Foraging Only . Known to Occur in Study Area.

Canvasbacks are a species of waterfowl restricted to the Americas. The species breeds in prairie potholes in Alaska, western Canada, and northwestern and north central U.S. In California, Canvasbacks are primarily encountered during migration (although some populations breed in the very northeast corner of the state). During the breeding season, the species may use multiple ponds for nesting, loafing, foraging, and brooding. Nests are constructed in aquatic emergent vegetation such as reeds and sedges and lined with down. The species tends to feed in shallow water but can dive up to 9 meters while foraging. Preferred food items are the roots and tubers of submerged vegetation as well as benthic invertebrates (Mowbray 2002).

Canvasbacks have been documented in the Project Area during the winter and wintering birds occur seasonally in the Project vicinity (eBird 2019). Based on historical records and available habitat, the species has a high potential to be seasonally present and forage around the study area.

American Bittern (*Botaurus lentiginosus*), CDFW Special Animals List (S3S4), High Potential, Foraging and Nesting.

The American Bittern is a crepuscular mid-sized heron with cryptic plumage. They breed in most of Canada and the northern U.S. states and winter in the southern U.S. There are pockets of year-round residents along the coast in the Pacific Northwest and along the Carolinas. The species is associated with freshwater wetlands containing tall emergent vegetation, although they will occasionally also use saltwater marshes. The species builds its nests in tall emergent vegetation (such as reeds) or riparian trees over water. Nest platforms are constructed out of reeds, sedges, and cattails. American Bitterns are opportunistic predators and will feed on a variety of invertebrates and vertebrates including frogs, small mammals, insects, and fish (Lowther et al. 2009).

The species is relatively rare in Humboldt County and only documented as a breeder in freshwater habitat locally (Hunter et al. 2005). This species has been detected in the Project Area year-round and suitable habitat is present on site (eBird 2019). Because no freshwater marsh habitat is present in the Project Area, breeding is unlikely. However, based on historical records and available habitat, the species has a high potential to be present, nest or forage within the study area.

Black Brant (*Branta bernicla nigricans*). CDFW SSC (S2), High Potential, Foraging Only. Known to Occur in Study Area.

Black Brant are a species of sea goose that breed in the arctic and sub-arctic and primarily winter in coastal bays and estuaries in Baja California. Humboldt Bay

serves as a critical wintering area and spring staging site for Black Brant (Lewis et al. 2013). In fact, Humboldt Bay is believed to be the most important spring staging site for Brant in California, and the fourth most important staging site in the Pacific Flyway (Moore et al. 2013). This is due to the presence of large eelgrass beds in Humboldt Bay, which serve as a critical food resource for Black Brant. Black Brant build energy stores necessary for breeding by foraging on eelgrass during the winter. The population of Black Brant that use Humboldt Bay as a stop-over site have an estimated population size of 150,000 birds and harvest is allowed during the winter under the species management plan (Pacific Flyway Council 2002).

Black Brant have been documented to feed on eelgrass beds during both low and high tides in Humboldt Bay and are relatively common winter visitors to the area (Elkinton 2013). Surveys have documented brant in both the North and South Bays (Moore et al. 2013). Black Brant have also been detected during the winter and spring migration in the Project Area and seasonal presence is possible (eBird 2019). Based on historical records and available habitat, the species has a high potential to be seasonally present and forage around the Project Area.

Vaux's Swift (*Chaetura vauxi*). CDFW SSC (S2S3), Moderate Potential, Foraging Only.

Swifts are summer residents in California, breeding on the coast from central California northward and in the Cascade 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 human-made substrates are also used for nesting. This species is highly aerial and forages widely for insects in open air. During migration, nocturnal roosting occurs communally; favored roosts may host thousands of individuals (Bull and Collins 2007).

The Project Area contains no trees or structures. Thus, the absence of suitable nesting and structures is a limiting factor for potential roosting or nesting in the study area. However, there are numerous records of this species from the Project vicinity (eBird 2019) and foraging habitat is likely present on the Project Site. The presence of nests/colonies in the Project Area is unknown and would require surveys to confirm. Based on historical records and available habitat, the species has a moderate potential to be present and forage around the study area.

Western Snowy Plover (*Charadrius nivosus nivosus*), Federally Threatened, CDFW SSC (S2S3). High Potential, Foraging and Nesting. Known to Occur in Study Area.

The Western Snowy Plover is a small, six-inch long shorebird, distinguishable from other shorebirds by its black legs, dark bars on either side of its breast, a dark fore-crown, dark eye patch, and brown to gray back (Page et al. 2009). Two distinct breeding populations of Western Snowy Plovers are known: the Pacific coast population and an interior population that breeds in Oregon, California, Nevada, Utah, New Mexico, Colorado, Kansas, Oklahoma, and Texas (USFWS 2007).

Snowy Plovers are year-round residents in suitable habitat 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 (Page et al. 2009). The Pacific coast population nests on beaches from the central Washington coast to the Baja California peninsula. The breeding season of the Pacific coast Western Snowy Plover lasts from early March through mid-September. Pair bonds are formed in mid-February.

Plovers prefer to nest in open areas such as blowouts above the high tide line on sand spits, dune-backed beaches, lagoon and estuary salt pans, and beaches near river and estuary mouths (USFWS 2007). They also may nest on sparsely vegetated dunes, salt pond levees, and river bars (Colwell et al. 2005, USFWS 2007). In Humboldt County, plovers preferentially select for gentle slopes of 0-4% on wide stretches of beach (220 ± 98 meters [m]) when choosing nest sites (Leja 2015). Nesting microhabitat within these larger landscape features include: open ground adjacent to driftwood, beached kelp, small plants, pebbles, shells, or other conspicuous items in an otherwise barren landscape (Page et al. 2009, Leja 2015). Nest scrapes are also constructed in areas relatively free of European beachgrass cover (Muir and Colwell 2010). Clutches tend to be three eggs and are laid in scrapes or depressions in the sand. These scrapes are lined with debris such as shell fragments, fish bones, pebbles, and bits of vegetation.

Wintering areas are usually similar to those used for nesting and include tidal flats, dune-backed beaches, salt-evaporation ponds, and agricultural waste-water ponds (Shuford et al. 1995, USFWS 2007). Pacific coast plovers commonly forage amongst piles of beached kelp and in the wet sand of the intertidal zone. Above the high tide line, they feed in dry sandy areas, salt pans, spoil sites, and along the edges of saltmarsh and ponds (USFWS 2007). Small invertebrates comprise the bulk of the Western Snowy Plover's diet and include but are not limited to Pacific mole crabs (*Emerita analoga*) and Striped Shore Crabs (*Pachygrapsus crassipes*), beetles, amphipods, insect larvae, flies, and caterpillars (Jacobs 1986, Page et al. 2009, Tucker and Powell 1999). Important habitat components for plover foraging sites include open, sandy areas within the high-tide line that contain tide-cast wrack, such as kelp and drift wood, that typically attract invertebrates (77 FR 36727-36869).

During the 20th century, the Snowy Plover breeding range along the California coast became extremely fragmented due to habitat loss (e.g., coastal development). Habitat loss is only one of numerous threats to the species. Other threats include but are not limited to human disturbance, predation by species associated with human development (e.g., corvids), and pesticides/inorganic contaminants, all of which affect reproductive success (Page et al. 2009, USFWS 2007). Further, the invasion of European beachgrass has led to declines in Western Snowy Plover wintering and nesting habitat along the Pacific coast (USFWS 2007). Predation by ravens may be the primary limiting factor for plovers in northern California. In addition, off-highway vehicle use of river bars has crushed nests and disturbed nesting plovers (Colwell et al. 2005, Lau 2015).

Critical habitat for the species was designated in 1999 and revised in 2012 (77 FR 36727-36869) and includes the entire dune complex from the Humboldt Bay South Spit, south to Centerville Beach, including the dunes within the Project Area and adjacent beaches (see Figure 3.4-4 – Critical Habitat for Western Snowy Plover). Western Snowy Plovers are known to use the beach adjacent to the Project Area year-round (both nesting and wintering populations). Numerous nests have been

documented on this beach, with most nesting attempts focused near the mouth of the Eel in the last few years (Colwell 2019, eBird 2019). Based on historical records and available habitat, the species has a high potential to be present, nest, and forage in the study area.

Northern Harrier (*Circus hudsonius*), CDFW SSC (S3), High Potential, Foraging and Nesting. Known to Occur in Study Area.

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 conversion, and monotypic farming. As a result, Northern Harriers have been designated as a CDFW Species of Special Concern, with further research necessary to determine the actual state-wide status of the species.

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).

There are records of this species from the Project Area year-round, and requisite foraging and nesting habitat is present at the Project Site (eBird 2019). Based on historical records and available habitat, the species has a high potential to nest and forage within the study area.

Olive-sided Flycatcher (*Contopus cooperi*), CDFW SSC (S4), USFWS BCC, High Potential, Foraging Only. Known to Occur in Study Area.

The Olive-sided Flycatcher breeds in coniferous forest edges in Canada and the western U.S. from sea level to the Rockies. They winter in Central America. Olive-sided Flycatchers build cup nests in conifers and deciduous trees such as willows. Nests are constructed out of twigs, grasses, and pine needles. The species is known to aggressively defend their nesting territories. Olive-sided Flycatchers feed primarily on flying insects, including bees, by catching them via “yo-yo flights” (Altman and Salabanks 2012).

Olive-sided Flycatchers have been detected in the Project Area in low numbers (eBird 2019). The Project Area may serve as foraging habitat for the species, although breeding habitat may be precluded as there are no trees onsite. However, based on historical records and available habitat, the species has a high potential to be present or forage within the study area.

Snowy Egret (*Egretta thula*), CDFW Special Animals List (S4), High Potential, Foraging Only. Known to Occur in Study Area.

Wintering populations of snowy egret are present along much of the California coast. They 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 the same and different species (conspecifics and allospecifics). Snowy Egrets hunt in shallow water and on shore, making use of their bill (via “bill-vibrating”) and distinctly yellow feet to capture and potentially attract prey items (Kushlan 1973, Willard 1977, Meyerriecks 1959).

Snowy Egrets are known to occur in the study area year-round and the Project Area contains potential foraging habitat for the species. The presence of any established colonies in the Project Area is unlikely (the closest known rookery is from Hookton Slough); however, based on historical records and available foraging habitat, the species has a high potential to be present and forage within the study area.

White-tailed Kite (*Elanus leucurus*), CDFW FP (S3S4), High Potential, Foraging Only.

White-tailed Kites are year-round residents in most of California west of the Sierra Nevada Mountains 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 on the top or upper third 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 and Sitka spruce. White-tailed Kites feed almost exclusively on small mammals captured via hover hunting (Dunk 1995).

White-tailed Kites are common in the Project vicinity and likely to occur year-round in the study area (eBird 2019). Marsh and grassland areas exist in the Project Area that could serve as foraging habitat for this species (nesting is precluded as no trees exist onsite). Accordingly, there is a high potential for them to forage in the study area.

Little Willow Flycatcher (*Empidonax traillii brewsteri*) State Endangered, USFWS BCC, High Potential, Fall Migration Only.

The Little Willow Flycatcher is a long-distance neotropical migrant that breeds west of the Cascade in the Sierra Nevada mountains up to southwestern British Columbia. The Little Willow Flycatcher is one of three subspecies of willow flycatcher that occur in California. The species winters in southern Mexico and northern South America. In California, known breeding locations are from Shasta, Kern, Alpine, Inyo, Mono, Santa Barbara, Riverside, and San Diego counties. The species was formerly widespread in California and has declined significantly as a result of riparian habitat loss and degradation.

The Willow Flycatcher is distinguished from other *Empidonax* flycatchers by its characteristic “fitz-bew” call (USFWS 2002). Willow Flycatchers are late spring migrants with abbreviated breeding seasons of only 70-90 days (Sedgwick 2000). They arrive on their breeding ranges in California in mid-May (Small 1994). They favor willow thickets in valleys, canyon bottoms, and mountain seepages, and riparian areas around lakes and streams adjacent to open areas (Sedgwick 2000). Territory size may range from roughly 3 to 5 kilometers (km) (Prescott 1986). Cup nests are created out of twigs, grass, and bark and lined with hair, grass, and

feathers. Nest are typically located low to the ground in willow shrubs and bushes. Willow Flycatchers primarily capture insects in flight (Sedgwick 2000).

The Little Willow Flycatcher may occur in Humboldt County during the spring, winter, and fall. Peak occurrences are during mid-May to mid-June and mid-August through September. The subspecies is an occasional breeder in Humboldt County (Hunter et al. 2005). The species was detected in the Project Area in August of 2019 (Eel River Wildlife Area Ocean Ranch Unit) (eBird 2019). As coastal dune willow thicket shrubland alliance is present in the Project Area, presence cannot be completely excluded. Based on historical records and available habitat, the species has a moderate potential to be seasonally present or forage within the study area.

Merlin (*Falco columbarius*), CDFW WL (S3S4), High Potential, Foraging Only During Winter.

The Merlin is a small falcon associated with the northern prairies and forests. The species breeds in Alaska, Canada, and interior Washington and Oregon. The wintering range includes the western U.S., Mexico, Gulf Coast, eastern seaboard, and Cuba. There are also resident populations along the coast of the Pacific Northwest into Canada, and in the interior mountain states. As is common with falcons, females are larger than males in size. Breeding sites include deciduous forest, prairie shelter belts, and coniferous forest. The species does not build its own nests, and instead uses the unoccupied nests of hawks or crows. Merlin feed on small birds as well as insects, frequently by catching them in flight.

This species is a common winter visitor to the Project vicinity and may forage within the Project Area (eBird 2019). Based on historical records and available habitat, the species has a high potential to seasonally be present and forage around the study area.

American Peregrine Falcon (*Falco peregrinus anatum*), CDFW FP (S3S4), USFWS BCC, High Potential, Foraging Only. Known to Occur in Study Area.

The Peregrine Falcon is one of the world's most widely distributed raptor species, occurring in urban areas, wetlands, deserts, maritime islands, mountains, tundra, and the tropics. 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 Dichlorodiphenyltrichloroethane (DDT). After DDT was banned in 1972, the Peregrine Falcon started to rebound nationwide.

In western North America, resident 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 (White et al. 2002). In California, Peregrines generally prefer open landscapes for foraging and cliffs, snags, or buildings 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 (Wrege and Cade 1977, White et al. 2002). Peregrine Falcons feed on a variety of avian species including passerines, waterfowl, and shorebirds. They have also been known to take bats, amphibians, fish, and mammals. Prey are taken in flight, off the surface of water, or on land (Sherrod 1978). The Peregrine Falcon is the fastest member of the animal kingdom

with diving (“stooping”) speeds recorded at speeds of 238 miles per hour (Franklin 1999).

Peregrines are a common visitor to the Project vicinity (year-round presence, although in greater numbers in the winter) and forage within the study area (eBird 2019). Based on available data and habitat criteria, nesting at or near the Project Area is highly unlikely. However, based on historical records and available habitat, the species has a high potential to be present and forage around the study area.

Bald Eagle (*Haliaeetus leucocephalus*), State Endangered, CDFW FP (S3), USFWS BCC, High Potential, Foraging Only. Known to Occur in Study Area.

The Bald Eagle is the second largest bird of prey in North America with a wingspan surpassed only by that of the California Condor (Palmer et al. 1988). Bald Eagles are found throughout North America, with year-round residents along both coasts and near large bodies of water such as rivers, lakes, and reservoirs. Seasonal breeding populations occur throughout most of Canada and Alaska, with these populations wintering through the U.S. and Central America. 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 (Buehler 2000, NatureServe 2019).

Bald Eagles nest in large trees, on cliffs, or on the ground in treeless regions adjacent to lakes, rivers, estuaries, and dams. 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).

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 sub-lethal effects of the organochlorine pesticide DDT (Weimeyer et al. 1993). Human persecution is also thought to have historically contributed to population declines through trapping, poisoning, and egg-collecting (Buehler 2000).

There are records of this species from the Project Area (individuals likely foraging nearshore along the coast (eBird 2019). Coniferous forest habitat adjacent to the Project Area could serve as nesting habitat for the species. Based on available data, the presence of any established breeders at or near the Project Area is currently unlikely. Based on historical records and available habitat, the species has a high potential to be present and forage around the study area.

Long-billed Curlew (*Numenius americanus*), CDFW WL (S2), USFWS BCC, High Potential, Foraging Only. Known to Occur in Study Area.

Long-billed Curlews are the largest shorebird species in North America. They breed in the northwestern U.S. and Canadian prairie states and winter in central California, Baja California, and along the Gulf of Mexico. Long-billed Curlews breed in long and short-grass prairies and build their nests on the ground. Nests are frequently constructed near conspicuous items on the landscape such as rocks, dung piles, or mounds of dirt. Both males and females participate in constructing nest scrapes. Scrapes are lined with dung, pebbles, grass, bark, twigs, and leaves. Both sexes incubate although males primarily take on parental care of chicks. Long-billed

Curlews forage on a variety of invertebrate species, but particularly select shrimp, crabs, and earthworms.

This species has declined in North America as a result of historic overharvesting and habitat loss (Dugger and Dugger 2002). The species does not breed in Humboldt County (Hunter et al. 2005, Leeman and Colwell 2005). There are numerous records of this species from the Project Area (particularly during fall migration and the winter) (eBird 2019). Based on historical records and available habitat, the species is present seasonally and has high potential to occur and forage around the study area.

Black-crowned Night Heron (*Nycticorax nycticorax*), CDFW Special Animals List (S4), High Potential for Foraging. Moderate Potential for Nesting. Known to Occur in Study Area.

Black-crowned Night Herons are year-round residents in much of California, with notable exceptions in the Sierra Nevada Mountains, 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 and nest with mixed species, building platform stick nests in trees, reeds, cattails, bushes, or on the ground on nearshore islands. As opportunistic feeders, Black-crowned Night Herons eat fish, insects, mammals, birds, carrion, clams, crayfish, turtles, and many other food items (Hothem et al. 2010).

There are numerous records of this species from the Project Area and requisite foraging (and potentially nesting) habitat may be present in the Project Area. Historical rookeries were present on an island in the nearby Eel River Delta (eBird 2019). Based on historical records and available habitat, the species has a high potential to be present and forage within the study area. Due to the cattails and reeds, or similar habitat, this species has a moderate potential to nest within the study area.

Osprey (*Pandion haliaetus*), CDFW WL (S4), High Potential, Fly-over or Foraging Only. Known to Occur in Study Area.

Ospreys have a nearly cosmopolitan distribution and their breeding range throughout North America is widespread. The majority of individuals within the breeding range are migratory (except for individuals in temperate southern areas of their range, e.g., in southern Florida, the Caribbean, southern California, and Baja California). In California, Ospreys breed throughout the state near various bodies of water including inland near rivers, reservoirs and lakes, as well as on the coast near bays, estuaries, and marshes. Specific nest location preferences include: proximity to shallow fish-bearing waters and a nest site free of predators (usually highly elevated but Ospreys nest on the ground on predator-free islands). Ospreys build large stick nests on a wide variety of natural and artificial nest substrates, especially trees, but also large rocks or bluffs, as well as nest platforms, towers supporting electrical lines or cell phone relays, and channel markers. Ospreys feed almost exclusively on fish, but anecdotal observations of non-fish prey have been documented (Bierregaard et al. 2016).

There are records of this species from the study area, including individuals likely foraging nearshore along the coast (eBird 2019). In addition, patches of coniferous

forest adjacent to the Project Area on Table Bluff could serve as nesting habitat for the species. Based on historical records and available habitat, the species has a high potential to be present and forage around the study area.

Bryant's Savannah Sparrow (*Passerculus sandwichensis alaundinus*) CDFW SSC S2S3, High Potential, Foraging and Nesting. Known to Occur in Study Area.

The Bryant's Savannah Sparrow is a subspecies of Savannah Sparrow that occurs year-round in coastal environments from Humboldt Bay south to Point Conception (Wheelwright and Rising 2020). Savannah Sparrows breeding in Humboldt County are considered to be strictly the *P.s. alaundinus* subspecies (those breeding in Del Norte County are considered to be *P. s. brooksi*, although this has not been confirmed via genetic studies). Other subspecies of Savannah Sparrow are present in Humboldt County during the non-breeding season (Hunter et al. 2005, Shuford et al. 2008). The *alaundinus* subspecies is primarily restricted to the coastal fog belt, but individuals have been documented as far 40 km inland in Humboldt County, near the town of Willow Creek (Hunter et al. 2005).

Habitat preferences include grasslands, tidal marshes, sparsely vegetated dunes, and agricultural areas such as dairy pastures (Wheelwright and Rising 2020, Hunter et al. 2005, Shuford et al. 2008). Occupancy of tidal marsh habitat appears to have declined as a result of habitat loss or conversion and no Savannah Sparrows have been recently documented nesting in this habitat in Humboldt County (Hunter et al. 2005, Shuford et al. 2008). In grassland habitat, grass height may be a limiting factor to nesting (i.e. species prefers short grass) (Kwasny 2000). The subspecies breeds from early April to as late as mid-August (Hunter et al. 2005, Shuford et al. 2008). Nests are open cups constructed under dense cover, either on the ground or in clumps of grass or pickleweed. The subspecies feeds on insects, seeds, and fruit (Shuford et al. 2008).

The Bryant's Savannah Sparrow is a resident breeder within the Project Area (M. van Hattem, pers. comm. 2019). The species (Savannah Sparrow) has been documented numerous times throughout the Project Area (eBird 2020). Due to the suitable habitat and previous observations, this subspecies is assumed to have high potential of occurring in the Project Area.

Double-crested Cormorant (*Phalacrocorax auritus*) CDFW WL, S4, High Potential, Likely Foraging, Possibly Nesting.

Double-crested Cormorants are widely-distributed in North American, with resident populations along the southern coasts and breeding populations in the Canadian and U.S. interior and northern coastal areas (Hatch 1995). Interior and eastern populations are highly migratory (Dorr et al. 2014). In California, Double-crested Cormorants breed along most of the California coast and some inland areas such as the Salton Sea, Central Valley, and Colorado River (Small 1994). Cormorants are associated with aquatic environments such as coastal or aquaculture areas with suitable roosting and loafing sites on rocks, pilings, or sandbars (Dorr et al. 2014). Double-crested Cormorants nest colonially on the ground, cliffs, power poles, rock islands, or trees or shrubs (Stenzel et al. 1995, Chapdelaine and Bédard 2005). Nests are composed of small sticks, seaweed, and trash such as rope, balloons, and

fishing line. Double-crested Cormorants typically feed in shallow, open water fairly close to shore. They are primarily eat fish but also will eat crustaceans, insects, , and amphibians (Palmer 1962, Colman et al. 2005).

In Humboldt County, breeding is restricted to offshore islands, nearshore sea stacks, or structures in Humboldt Bay such as Old Arcata Wharf (Hunter et al. 2005). The Project Area contains suitable foraging habitat. Individuals may also fly over the Project Area on the way to additional foraging habitat on the Pacific Ocean.

Purple Martin (*Progne subis*), CDFW SSC (S3), High Potential, Foraging Only. Known to Occur in Study Area.

The Purple Martin is the largest swallow species in North America. Purple Martins breed throughout the eastern U.S. (with the exception of the north Atlantic states), the Canadian prairie states, the west coast of North America, and the southwest. They winter in Central America. The species breeds colonially in human-made bird boxes, although historically, they nested solitarily in abandoned woodpecker holes. Historical habitat nesting preferences included forest edges, although now the species is found primarily in association with human development. Purple Martins feed almost exclusively on flying insects (Brown and Tarof 2013).

There are several occurrences of this species from the Project Area and the species may forage onsite. Nesting would be precluded as there are no trees or structures onsite. However, based on historical records and available habitat, the species has a high potential to forage within the study area, especially during migration.

Bank Swallow (*Riparia riparia*), State Threatened (S2), Moderate Potential, Foraging Only.

In North American, Bank Swallows breed in most of North America at low elevations in suitable habitat. Breeding ranges extend from Alaska to Northern California, and occasionally occurs in the southern half of the U.S. Wintering grounds occur along the western coast of Central America. In California, Bank Swallows are found in Siskiyou, Shasta, Yolo, Del Norte, Humboldt, 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).

No muddy banks/cliffs for nesting are present in the Project Area. However, there are species reliable nesting records from the Project vicinity, near the confluence of the Van Duzen and Eel River, above Fernbridge, and below Cock Robbin Island above the confluence with the Salt River (eBird 2019). Based on available habitat in the study area, the presence of any established breeding colonies at or near the Project Area is unlikely; however, the species has a moderate potential to be present and forage around the study area based on available habitat.

Rufous Hummingbird (*Selasphorus rufus*), USFWS BCC, (S1S2), High Potential, Foraging Only. Known to Occur in Study Area.

Rufous Hummingbirds breed in Alaska, Western Canada, and Western North America and winter in Baja, Mexico, and along the Gulf Coast. In California, the breeding range is restricted to northwestern coastal areas into the foothills and Sierras. Females build nests in shrubs and trees. Nests are constructed out of spider silk, bark, moss. Rufous Hummingbirds feed on floral nectar, tree sap, and small insects. The species is extremely territorial and defends food resources aggressively (Healey and Calder 2006).

There are records of this species from the study area and suitable foraging habitat for the species may be present onsite (eBird 2019). There is only one documented breeding record for this species in Humboldt County, and breeding onsite is highly unlikely (Hunter et al. 2005). Based on historical records and available habitat, the species has a high potential to be present or forage within the study area.

Yellow Warbler (*Setophaga petechia*), CDFW SSC (S3S4), USFWS BCC, High Potential, Foraging and Nesting. Known to Occur in Study Area.

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).

There are several occurrences of this species from the study area, and suitable riparian nesting habitat is present on the Table Bluff Slope west of Area E (eBird 2019). Based on available data, the presence of any established breeders in the Project Area is currently unknown. Based on historical records and available habitat, the species has a high potential to be present, forage, or nest within the study area.

Fish

Green Sturgeon – Northern DPS (*Acipenser medirostris*), CDFW SSC (S1S2), AFS Vulnerable. Moderate Potential.

Green Sturgeon are the most marine species of sturgeon; they feed in coastal marine and estuarine environments and adults return to selected large rivers to spawn. Ocean abundance increases northward of Point Conception. The Northern DPS is known to spawn in the Rogue and Klamath Rivers at temperatures between 8-14°C. Recent research indicates that a spawning run still occurs in the Eel River basin that appears to be of Northern DPS decent (SWS and Wiyot 2017). The Southern DPS, which was listed as threatened under the Endangered Species Act in 2006 (NMFS 2006), only spawns in the Sacramento River; however, listed Southern DPS green sturgeon may enter the Eel River estuary to feed (Lindley et al. 2011). Prefers spawning substrate of large cobble but can range from clean sand to bedrock. The Eel River green sturgeon appear to be of the northern Distinct Population Segment (DPS), which are not federally-protected under the Endangered Species Act (ESA) (Stillwater Sciences and Wiyot 2017); however, listed southern

DPS green sturgeon may enter the estuary to feed (Lindley et al. 2011). Repeated observations of small numbers of adult and juvenile green sturgeon in the Eel River since 2002 suggest spawning may have resumed there after decades of spawning absence (Higgins 2013 in CDFW 2015a). This species may utilize McNulty Slough.

Pacific Lamprey (*Entosphenus tridentatus*) CDFW SSC (S3), AFS Endangered. Moderate Potential.

The Pacific Lamprey, *Entosphenus tridentatus* formerly *Lampetra tridentata*, is a primitive fish lacking true fins and jaws of true fishes (Streif 2007, Stillwater Sciences 2010). They appear eel-like and have a sucker-like mouth, no scales, and breathing holes instead of gills (Streif 2007, USFWS 2019). Pacific Lamprey range from the Japan to the Bering Sea in Alaska and along the west coast of North America to central Baja, California (Stillwater Sciences 2010). Widely distributed throughout the Eel River Basin, although population numbers have declined substantially (Stillwater Sciences 2010).

Pacific Lamprey are anadromous with typical spawning from March through July (Stillwater Sciences et al. 2016). Both sexes build redds (nests) where eggs are deposited by moving stones with their mouths, typically in riffles of gravel-bottomed streams and upstream of quality ammocoete (larval lamprey) habitat. Females may lay 30 to 240 thousand eggs (Stillwater Sciences et al. 2016). Adults then die within a few days to a month of spawning (Streif 2007). Ammocoetes hatch within approximately 19 days depending on water temperature (Streif 2007). Upon hatching, ammocoetes move downstream where they settle into silty sandy substrates (Streif 2007). They remain in these areas, often in colonies, for two to seven years filter feeding primarily on algae until they metamorphose into macrophthmia (juveniles; Streif 2007). During this metamorphosis, they develop eyes, a suckoral disc, sharp teeth, and more-defined fins allowing them to be free swimming (Streif 2007, Stillwater Sciences et al. 2016). As macrophthmia, they emigrate downstream to the ocean (Streif 2007). They mature into adults where they are parasitic on a variety of fishes. Adults return to their natal streams following one to three years in the marine environment (Streif 2007). There may be two major life strategies in which some adults spawn immediately upon returning to freshwater and other adults may overwinter in freshwater before spawning (Streif 2007, Stillwater Sciences et al. 2016).

Pacific Lamprey is of particular cultural value to many native indigenous tribes, including the Wiyot Tribe in the larger Fortuna area, and was historically a major fishery in the Eel River basin. Threats to their populations are similar to those experienced by salmonid species (Stillwater Sciences and Wiyot Tribe 2017). These threats include fish passage barriers (e.g. dams), diversions, urban development, mining, pollution, estuary modification, stream and floodplain degradation, declines in prey abundance predation by non-native species, and overharvest (Streif 2007, Stillwater Sciences and Wiyot Tribe 2017).

Pacific Lamprey are common in the Eel River year-round and ammocoetes have recently been documented at Fernbridge (GHD staff pers. obs.). Microhabitat preferences include streams with swift-current gravel-bottomed areas for spawning with water temps between 12-18° C (Stillwater Sciences and Wiyot Tribe 2016). Ammocoetes need soft sand or mud. Due to the lack of spawning habitat (freshwater

gravel bottomed streams or riffle habitat), it is assumed that there is moderate potential for non-spawning Pacific Lamprey to be present at the study area. In the Eel River watersheds the primary threats are associated with water quality issues, such as high water temperatures and nutrient loading, as well as watershed management effects on channel morphology and bedload dynamics in the Lower Eel, and predation by Sacramento Pikeminnow (USFWS 2019).

Tidewater Goby (*Eucyclogobius newberryi*), Federally Endangered. High Potential. Known to Occur in Study Area.

Tidewater Goby occurs 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 (USFWS 2005). Storm events that result in sand bar breaches may disperse gobies up to several kilometers from extant populations (Lafferty et al. 1999a, 1999b). Tidewater Goby spend their entire life cycle in brackish estuaries and require stable low salinity, low velocity refuge habitat during their early life history (Hellmair and Kinziger 2014).

Tidewater Goby regularly occur in the Project Area, particularly in the northern portion of the Project Area (i.e., portions of Areas A and E) (Wallace and Gilroy 2008, Scheiff et al. 2013, Ray 2018b). The closest area designated as critical habitat for Tidewater Goby is located in a slough channel approximately 0.5 mile (0.8 kilometer) east of the Project Area in Cannibal Island located in the Eel River estuary. Designated critical habitat for Tidewater Goby is located in a slough channel approximately 0.5 miles east of the Project Area and within the Eel River estuary.

Coastal Cutthroat Trout (*Oncorhynchus clarkii clarkii*), CDFW SSC (S3). High Potential.

The Coastal Cutthroat Trout ranges from the southernmost extent of its range in the Eel River to Prince William 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 (Moyle et al. 2008). Unlike most salmon, and similar to Steelhead, this species may spawn more than once. Adults commonly enter streams during the fall and feed on eggs from salmon redds. Spawning can occur from December through May. Young Cutthroat Trout may spend up to two weeks in the gravel before emerging and from one to nine years in freshwater 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 Trout 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 Trout's survival. During the estuarine or ocean phase of life, Cutthroat Trout utilize 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, and the Salt River (Downie and Lucey 2005, Scheiff et al. 2013). This species has been documented in the Eel River estuary as well as lower Eel River tributaries such as the Salt River (CDFW 2015a, CDFW 2019a). Although no Cutthroat Trout have recently been found in McNulty Slough or the Project Area, this species is assumed to either be present or have a high potential to occur in the study area based on nearby occurrences.

Coho Salmon, Southern Oregon-Northern California Coast ESU (*Oncorhynchus kisutch*). Federal Threatened, State Threatened. High Potential. Known to Occur in Study Area.

Coho Salmon in the study area are part of the Southern Oregon Northern California (SONCC) Evolutionarily 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) and can extend as late as February or March (Weitkamp et al. 1995). Coho Salmon eggs incubate for 35-50 days between November and March depending on water temperature. 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. Juveniles may rear in freshwater 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 freshwater for a second year. Estuaries are an important transition area and may be occupied for days to months (Schlosser and Eicher 2012); juvenile Coho Salmon are known to be present in the Eel River estuary in the winter months. Adult Coho Salmon 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 Fisheries 2016), and CDFW's Recovery Strategy for Coho Salmon (CDFG 2004). Coho Salmon stocks between Punta Gorda, California and Cape Blanco, Oregon are depressed relative to past abundance. 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 including dam construction, instream flow alterations, and land use activities coupled with large flood events, fish harvest, and hatchery effects (NMFS 2014, CDFW 2015b). Nearby tributary streams provide potential rearing and spawning habitat for Coho Salmon. Coho Salmon are assumed to be already present in the saltmarsh portions of the Project Area and have been found in adjacent McNulty Slough (Scheiff et al. 2013). Juvenile Coho Salmon were

captured in five of nine monthly samples during 2014 and 2015 at the nearby lower Salt River (Ross Taylor and Associates 2015). In 2019, 315 juvenile Coho Salmon were captured via a single pass with a seine net within Salt River, and two juvenile Coho Salmon were caught in tributary creeks to Salt River (R. Taylor pers. comm. 2020), suggesting that the species is able to readily utilize recently restored tidal marsh habitat.

As noted above, this species has been documented in tidal portions of the Project Area, and records of this species exist from the adjacent McNulty Slough (Cannata and Hassler 1995, Scheiff et al. 2013). Critical habitat for this species is designated within McNulty Slough. Young of the year Coho Salmon are not expected to utilize habitat in the Project Area in late spring and summer because water temperatures are not suitable (they are greater than 17°C) (Wallace & Gilroy 2008).

Steelhead, Northern California DPS (*Oncorhynchus mykiss*). Winter and Summer Run Federally Threatened; Summer Run State Candidate. High Potential. Known to Occur in Study Area.

Northern California DPS Steelhead include a winter run and a summer run life history. Winter run Northern California Steelhead enter freshwater between November and April and migrate to spawning areas between December and May. Adult summer run northern California Steelhead enter freshwater between April and June and migrate to summer holding areas in the mainstem and Middle Fork Eel River, and Van Duzen River. They spawn between November and January.

Steelhead trout are a unique species. Individuals develop differently depending on their environment. All steelhead trout hatch in gravel-bottomed, fast-flowing, well-oxygenated rivers and streams. Some stay in fresh water all their lives, and are called rainbow trout. Steelhead trout that migrate to the ocean typically grow larger than the ones that stay in freshwater. They then return to freshwater to spawn. Winter run Northern California Steelhead are relatively abundant and widely distributed in the Eel River watershed; conversely, summer run steelhead are less abundant and their distribution is limited to specific areas of the Mainstem and Middle Fork Eel River and Van Duzen River. Like other coastal populations throughout California, steelhead use of the Eel River estuary was undoubtedly extensive with multiple life stages utilizing the estuary throughout the year (NMFS 2016). Spawning and juvenile rearing of Steelhead generally take place in small, moderate-gradient (generally 3-5 percent) tributary streams (Nickelson et al. 1992). Steelhead juveniles rear for one to four years in tributary streams before migrating downriver between February and May. Most Steelhead smolts migrate to sea by June, although juveniles may be present in the estuary all year (Cannata and Hassler 1995; Puckett 1968).

Critical habitat for this species has been designated in the Eel River estuary. The species is present in tidal portions of the Project Area, and records of this species exist from the adjacent McNulty Slough (Cannata and Hassler 1995, Scheiff et al. 2013). Water quality conditions within McNulty Slough appear to be acceptable for outmigrating Steelhead (Wallace and Gilroy 2008). Accordingly, this species is assumed to be present or have a high potential to occur in saltmarsh portions of the study area.

Chinook Salmon, California Coastal ESU (*Oncorhynchus tshawytscha*), Federally Threatened. High Potential. Known to Occur in Study Area.

This ESU occurs from Redwood Creek south to the Russian River and includes Chinook Salmon 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 Salmon are reportedly present in the estuary from spring through fall (Cannata and Hassler 1995), and juveniles have been documented both in McNulty Slough (Scheiff et al. 2013) and in the Project Area (Ray 2018a).

Estuaries are highly productive systems representing a mosaic of habitats connecting rivers to the sea, and are highly important for juvenile salmon species to find prey communities, shade, refuge from predation and transitional habitat for the osmoregulatory changes experienced by anadromous fishes (Goertler 2014). Studies and surveys consistently show that juvenile salmonids grow faster in backwater channel, and floodplain habitat as compared to mainstem waterways (Katz 2017, Goergler 2014, Wallace et al. 2018). This is, in part, due to the energy saved from not swimming in channelized, fast moving currents, and due to the available food sources and cover from predators.

Critical habitat for this species is designated in McNulty Slough. As noted above, this species has been documented in the Project Area and is expected to be present during spring outmigration (March through June). Water quality conditions within McNulty Slough appear to be acceptable for outmigrating juvenile Chinook Salmon (Wallace and Gilroy 2008). Accordingly, Chinook Salmon are assumed to be present or have high potential to occur in the tidal portions of the Project Area.

Longfin Smelt (*Spirinchus thaleichthys*), Federal Candidate, State Threatened. High Potential.

Longfin Smelt is a small, pelagic, estuarine fish listed as threatened under the California Endangered Species Act (CESA). This anadromous fish exhibits complex life history patterns, using a variety of habitats from nearshore waters, to estuaries and lower portions of freshwater streams (Garwood 2017). Most of the species 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).

Spawning was noted in both the Eel River and in tributaries to Humboldt Bay, with pre-and post-spawn individuals observed in tributaries to Humboldt Bay in more recent years (Garwood 2017). Use of nearshore waters was also noted with most longfin smelt collected in shallow waters relatively close to shore in the vicinity of known spawning areas (Garwood 2017). Longfin Smelt were observed in many areas throughout the Eel River estuary and mainstem portions of the Eel River coastal plain (Garwood 2017). Most of the Longfin Smelt data collected in the Eel River estuary has come from two studies, Puckett (1977) and Cannata and Hassler (1995); Cannata and Downie (2009) summarized records as far back as the 1950s. More recently approximately 50-100 Longfin Smelt individuals were captured from lower McNulty Slough in 2007 (M. Wallace pers. comm. 2020), and Longfin Smelt were observed in McNulty Slough in 2009 as well (Schieff et al. 2013). Potentially

suitable habitat is available within the Project Area, which is supported by observations of the species in 2007 and 2009 (Scheiff et. al. 2013). Eight individuals were captured during December 2014 and February 2015 sampling of nearby recently restored Salt River and Riverside Ranch locations, suggesting that Longfin Smelt may be able to colonize portions of the Eel River estuary after tidal action is restored. The species is assumed to be already present in the saltmarsh portions of the study area due to information and accounts described above.

Reptiles

Northwestern Pond Turtle (*Emys marmorata marmorata*)¹, CDFW SSC, Moderate Potential.

Northwestern Pond turtles occur in a variety of permanent and semi-permanent freshwater aquatic habitats including lakes, rivers, ponds, creeks, and marshes. The species also has the ability to regulate their physiology (increase urea concentration, excrete salt, etc.), which allows them to occupy brackish environments, including tidal estuarine marsh (Agha et al. 2019). Nesting occurs on land in areas of loose to hard-packed soils on south or west facing slopes (Rathburn et al. 1992, Reese and Welsh 1997). The species is frequently observed basking on exposed banks, logs, and rocks. Winter activity is possible but limited to unusually warm, sunny days. Normally pond turtles are dormant during winter months on the North Coast, which typically involves the turtle burrowing into loose substrate above the high-water mark (Thompson et al. 2016).

There is one recent (2017) record of this species from the Project vicinity, and freshwater aquatic habitat is present on the north end of Area E in the Project Area (CDFW 2019a). Based on historical and current records and available habitat, Northwestern Pond Turtles are likely restricted to the north end of Area E in the study area.

Amphibians

Northern Red-legged Frog (*Rana aurora*), CDFW SSC, High Potential. Known to Occur in Study Area.

Northern Red-legged Frogs occur along the west coast of North America from British Columbia to California. The geographic range split between the Northern and California Red-legged Frog species occurs just south of Elk Creek in Mendocino County where both species overlap (Nafis 2016, AmphibiaWeb 2019). Northern Red-legged Frogs are typically found near freshwater sources (e.g., wetlands, ponds, streams, etc.). However, they can range widely in uplands and inhabit damp places far from water. Northern Red-legged Frogs reproduce in water from November to March in Humboldt County, with some breeding occurring as late as

¹ 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*.

April. Preferred egg laying locations are in “vegetated shallows with little water flow in permanent wetlands and temporary pools” (Nafis 2016).

Northern Red-legged Frogs are relatively common in and near-coastal portions of Humboldt County (AmphibiaWeb 2019). Requisite breeding and dispersal habitat (coastal wetlands and riparian habitat) for the species is present in the Project Area on the north end of Area E and C, and there are numerous records of this species from the Project vicinity (CDFW 2019a, iNaturalist 2019). Based on historical records and available habitat, Northern Red-legged Frogs have a high potential of occurring within freshwater and upland portions the study area.

Invertebrates

Obscure Bumble Bee (*Bombus caliginosus*), CDFW Special Animals List, Moderate Potential.

The study area falls within the current documented range of the Obscure Bumble Bee and includes the fog-belt coastal habitat preferred by the species (Hatfield et al. 2014). Preferred plants for foraging (such as *Grindelia sp.*, *Baccharis sp.*, and *Lupinus sp.*) are present on or adjacent to the Project Area. California Department of Fish and Wildlife records have documented the species in Humboldt County (CDFW 2019a). In addition, the species was recorded during *Bombus* surveys on the North Spit of Humboldt Bay and Lanphere Dunes in 2010 (Julian 2012). Based on historical records and available habitat, Obscure Bumble Bees have a moderate potential of occurring within the study area.

Key to Status Codes:

FE = Federal Endangered

FT = Federal Threatened

FC = Federal Candidate

FD = Federal Delisted

PT = Proposed Threatened

BCC = USFWS Birds of Conservation Concern

SE = State Endangered

ST = State Threatened

SC = State Candidate

SD = State Delisted

SNR = State Not Ranked

MMPA = Marine Mammal Protection Act Protection

SR = State Rare

SSC = CDFW Species of Special Concern

CWL = CDFW Watch List

CDFW Special Animal List State Ranking:

- S1: Critically Imperiled
- S2: Imperiled
- S3: Vulnerable
- S4: Apparently Secure
- S5: Secure

WBWG = Western Bat Working Group (independent group composed of agencies, organization and individuals interested in bat research, management and conservation):

- WBWG High Priority: represents species considered highest priority for funding, planning, and conservation actions. These species are imperiled or at high risk of imperilment.

- WBWG Medium Priority: indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the

species and possible threats including lack of meaningful information).

- WBWG Low Priority: indicates that most of the existing data support stable populations of the species, and that the potential for major changes in status in the future is considered unlikely.

AFS = American Fisheries Society

- EN: Endangered
- TH: Threatened
- VU: Vulnerable

Potential to Occur:

No Potential: Habitat on and adjacent to the Project Area 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 Project Area is unsuitable or of very poor quality. The species is not likely to be found in the Project Area.

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 Project Area is unsuitable. The species has a moderate probability of being found in the Project Area.

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

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