Conceptual Environmentally Sensitive Habitat Area Mitigation Plan

Humboldt Bay Offshore Wind Heavy Lift Marine Terminal
Samoa, California

Prepared for:

Moffatt and Nichol

March 2024

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Humboldt Bay Offshore Wind Heavy Lift Terminal
Eureka, California

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March 2024

QA/QC:JLS
Reference: 022054.400

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Abbreviations and Acronyms

Terms of Measurement

ft	feet

Additional Terms

CCA	California Coastal Act
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CNPS	California Native Plant Society
ESHA	Environmentally Sensitive Habitat Area
FAC	Facultative wetland indicator status
FACU	Facultative upland indicator status
FACW	Facultative wetland indicator status
MF	Manufacturing Facility
MLLW	Mean Lower Low Water
MHHW	Mean Higher High Water
NAVD	North American Vertical Datum
NL	Not listed wetland indicator status
NOP	Notice of Preparation
O&M	Operation and Maintenance
OBL	Obligate wetland indicator status
QMS	Quality Management System
SandI	Staging and Integration
SLR	Sea Level Rise
SPD	South Pacific Division
UPL	Obligate upland indicator status
USACE	United States Army Corp of Engineers
USFWS	United States Fish and Wildlife Service
WTD	Wind Turbine Device

1.0 Introduction

This Conceptual Environmentally Sensitive Habitat Area Mitigation Plan (Plan) has been developed as a conceptual plan for onsite mitigation to address some of the impacts to wetland and non-wetland Environmentally Sensitive Habitat Area (ESHA) that will occur as a result of the proposed Humboldt Bay Offshore Wind Heavy Lift Terminal (project). This conceptual plan is not intended to address all impacts to ESHA that may occur as a result of the project, but rather is focused on the onsite mitigation area to the north of the Proposed Project. As of the writing of this plan, the project site design has not been submitted beyond broad conceptual drawings, nor has a project description been completed. Assumed impacts to sensitive resources are estimated based on the broad conceptual drawings of the site design that may change. A final mitigation plan can be written using the findings in this report following completion of site design and a project description. This report is not intended to be a "shovel ready" mitigation plan, but rather it should be used to inform final mitigation design, including mitigation ratios, identification of mitigation opportunities and wetland design and can also pinpoint other mitigation needs that cannot be addressed onsite.

The goals of this Conceptual Mitigation Plan are to:

1) Identify preliminary estimates of impacts to wetlands, other water, coastal wetland features, and non-wetland ESHA that may occur as a result of the project.
2) Develop conceptual plans for onsite self-sustaining freshwater wetland habitat along Humboldt Bay to compensate for the loss of wetlands as a result of the project,
3) Develop conceptual plans for onsite self-sustaining brackish, tidally-influenced Estuarine wetland habitat along Humboldt Bay to compensate for the loss of wetlands as a result of the project,
4) Develop conceptual plans for onsite self-sustaining sensitive natural communities within created wetlands and in the upland areas surrounding the wetland creation areas to compensate for the loss of sensitive natural communities resulting from the project,
5) Develop conceptual plans for the restoration of degraded sensitive natural communities within the onsite mitigation area through the removal of invasive species and anthropogenic debris, coupled with planting of native species to compensate for the loss of sensitive natural communities resulting from the project, and
6) Develop a suitable monitoring schedule and methods to adequately determine the success of the mitigation effort over time.

2.0 Project Description

The Proposed Project will include the redevelopment of the approximate 180-acre site on the Samoa Peninsula, which will provide a new multipurpose, heavy-lift marine terminal facility to support the offshore wind energy industry and other coastal-dependent industries.

The Project will include the facilities required to service the offshore wind industry, including:

a. Onsite manufacturing/fabrication (MF) facilities that:

i. Receive deliveries of raw materials and large offshore wind components primarily via waterborne transport.

ii. Create larger components in the offshore wind supply chain, such as blades, towers, nacelles (turbine hubs), mooring lines, anchors, transmission cables, and/or floating foundations.

iii. Include a range of buildings, including manufacturing facilities, transit sheds, offices, and/or warehouse buildings.

iv. Provide space for storage of completed components.

b. Staging and integration (SandI) facilities that include:

i. Wharf/terminal/yard facilities designed to receive, stage, and store offshore wind components, including ship-to-shore unloading capability, fixed position ring crane unloading capability, crawler crane unloading capability, and/or roll-on / roll-off capability.

ii. Heavy-lift wharfs with high-bearing capacities that can support large cranes capable of:

1. Conducting the final assembly of floating foundations.

2. Vertically integrating the various offshore wind components into deployment-ready fully-constructed floating offshore Wind Turbine Devices (WTDs).

3. Performing major maintenance on previously-deployed WTDs that must be towed back to port for repairs that cannot otherwise be performed in the offshore wind area, such as replacement of a nacelle or blade.

4. Decommissioning, disassembling, recycling, and disposing of WTDs that are at end of life.

iii. Berths adjacent to the heavy-lift wharfs within which:

1. Floating foundations can be launched, potentially with a sinking basin.

2. All components can be vertically integrated together on top of a floating foundation.

3. WTDs can be repaired, maintained, and/or decommissioned.

4. WTDs can be towed out of the bay and into the ocean.

c. Operation and Maintenance (O&M) facilities that can serve as a base of wind farm operations with warehouses/offices, spare part storage, and marine facility to support vessel provisioning and refueling/charging for O&M vessels during the operational period of the offshore wind farm.

d. Wet storage space in which floating foundations or WTDs can be temporarily moored to mitigate the risk of weather downtime, vessel traffic, entrance channel congestion, and other transportation risks. These will take two forms:

i. On-terminal wet storage occurs immediately offshore of the site and is accessed via small piers and gangways in which workers and small wheeled equipment can access floating turbines, typically fully-integrated WTDs that are near-ready to deploy to the ocean.

ii. Off-terminal wet storage occurs away from the immediate site, but also outside of the Federal navigation channels.

In order to accomplish the above, the Project includes demolition of existing structures, site preparation, marine terminal construction, dredging, establishment of wet storage sites, and habitat restoration. Project activities that may impact wetlands documented in this report are described below:

Demolition and Construction Upland Development Subarea

The following activities may occur within the Upland Development Subarea, which is the 180-acre Project area analyzed in this report.

1. Vegetation clearing and grubbing.

2. Demolition.

    a. Demolish and remove existing buildings and structures.

    b. Demolish existing asphalt, concrete, and remnant foundations of previously demolished buildings/structures. Some of these materials may be ground onsite and re-used as fill material. Unused material will be disposed of at an appropriately permitted location.

3. Remove, reuse, relocate, update, and/or modernize existing utilities including:

    a. Water storage tanks.

    b. Power poles and lines.

    c. Underground industrial water lines.

    d. Underground domestic water lines.

    e. Underground baywater water lines.

    f. Telecommunication lines.

    g. Gas lines.

    h. Sanitary sewer.

    i. Stormwater systems.

4. Cut, fill, and site regrading in anticipation of sea level rise to obtain final ground elevations between +13 to +17 feet North American Vertical Datum 1988 (NAVD88; such as: +12.66 to +16.66 Mean Lower Low Water [MLLW]). Dredge material and/or upland sources may be used as imported fill.

5. Import and install compacted gravel throughout the site for a finished wear surface.

6. Asphalt roads and parking areas in certain discrete areas (for example, a 200-space parking lot and areas near buildings).

7. Construct approximately 650,000 square feet of building space for manufacturing, repairs, offices, restrooms, and storage.

8. Construct internal transportation network of paved and/or compacted gravel roads.

9. If needed, improve up to two intersections on New Navy Base Road and the intersection of Cookhouse Road and Vance Avenue.

10. Install high mast terminal lighting (approximately 150 feet [ft] high) around the perimeter of the site and other, shorter lighting as needed.

11. Make drainage improvements for stormwater, which may include retention ponds, detention ponds, bioswales, and subsurface detention.

12. Install charging infrastructure for electric vehicles and electrified construction equipment such as forklifts.

13. Install fueling stations for land-based vehicles.

14. Install connection to electricity substation currently located directly south of the Project site.

15. Install solar panels on ash landfill and connect to substation.

Marine Development Subarea

The following activities may occur within the Marine Development Subarea.

1. Demolish an existing approximate 6-acre wooden dock at Terminal I and No Name Dock.

2. Construct up to three wharfs totaling a maximum of approximately 2,500 ft along the shoreline. The wharfs will consist of pile supported, vessel berth structures. This will include installation of steel and/or concrete piles. These wharfs could be discontinuous from one another or cojoined to one another.

3. Dredge berths between the newly constructed wharfs and the federal navigation channel to approximately – 40 ft MLLW for deep draft cargo vessel access and WTD construction activities.

4. Dredge a sinking basin to approximately -60 ft MLLW to accommodate semi-submersible vessel operations for device float off.

5. Construct a pier and associated gangways to an on-terminal wet storage facility. An on-terminal wet storage berth will be dredged between the pier/gangways and the federal navigation channel to a depth of up to -40 ft MLLW. The pier and gangways will allow land-based access of workers and small wheeled equipment to these temporarily-stored units.

3.0 Preliminary Assessment of Impacts to Wetlands Waters and Sensitive Habitat

This preliminary assessment of impacts to wetlands, waters, coastal wetland features and other non-wetland ESHA is based on the conceptual overview design provided for the Notice of Preparation (NOP). This broad conceptual site plan overview is included as Figure 1 and the project location map is included as Figure 2. All impacts are anticipated to be permanent impacts resulting from the complete reconfiguration and development of the site. While the details of the impacts are conceptual at the time of the writing of this plan, the site will be completely redeveloped, making avoidance impractical, necessitating mitigation outside of the project footprint.

3.1 Impacts to Aquatic Resources

Project impacts to wetland habitats have been identified based upon the Cowardin classification system (Cowardin 1979) were possible. A summary of wetlands likely to be impacted by the Proposed Project are included in Table 1 below:

Table 1. Aquatic Resources Potentially Impacted by the Project

Aquatic Resource Type	Total Impact Area (Acres)	Federal Jurisdictional Impacts (Acres)	401 Jurisdictional Impacts (Acres)	Coastal Act Jurisdictional Impacts (Acres)
Three-parameter Wetlands				
Estuarine Wetlands	0.052	0.052	0.052	0.052
Palustrine Emergent	0.066	0.052	0.066	0.066
Palustrine Scrub-shrub	0.203	0.004	0.203	0.203
Palustrine Forested	0.082	0.006	0.082	0.082
Total Three-parameter wetland Impacts	**0.403**	**0.114**	**0.403**	**0.403**
Artificial Aquatic Features				
Concrete Vault and Foundation	0.015	0	0.015	0.015
Drying Shed Foundations	0.354	0	0.353[a]	0.353[a]
Stormwater Collection System	0.183	0	0.183	0.183
Total Artificial Aquatic Feature Impacts:	**0.552**	**0**	**0.552[a]**	**0.552[a]**
Other Waters of the State (Coastal Act)				
Artificial Coastal Aquatic Features	0.230	0	0	0.230
Other Coastal Aquatic Features	0.470	0	0	0.470
Total Coastal Aquatic Feature Impacts:	**0.700**	**0**	**0**	**0.700**
Total Aquatic Resources Potentially Impacted by the Project:	**1.655**	**0.114**	**0.955**	**1.655**

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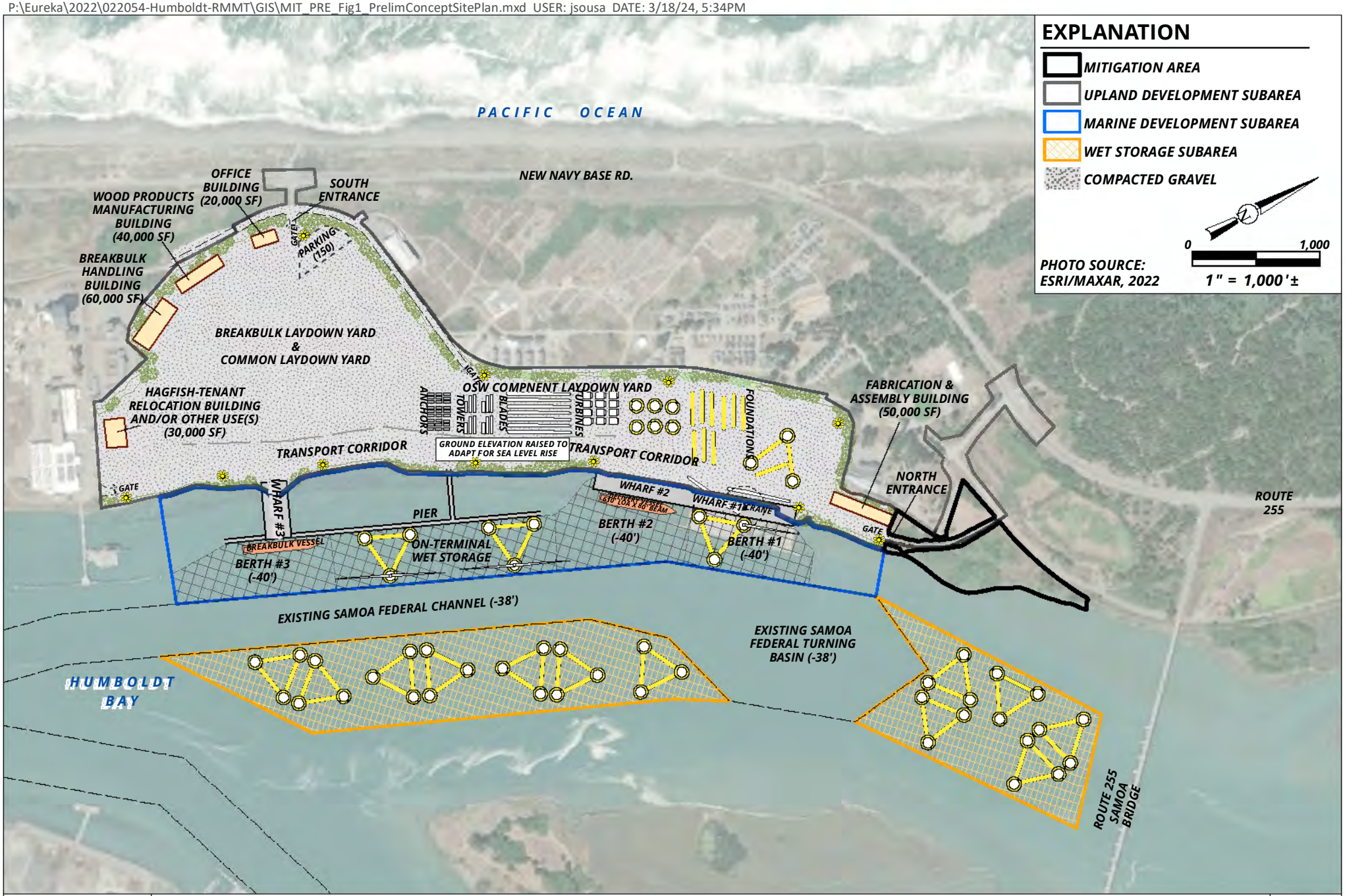

Humboldt Bay Harbor, Rec., & Cons. District
Humb. Bay Offshore Wind Heavy Lift Marine Terminal
Eureka, California

Preliminary Conceptual Site Plan

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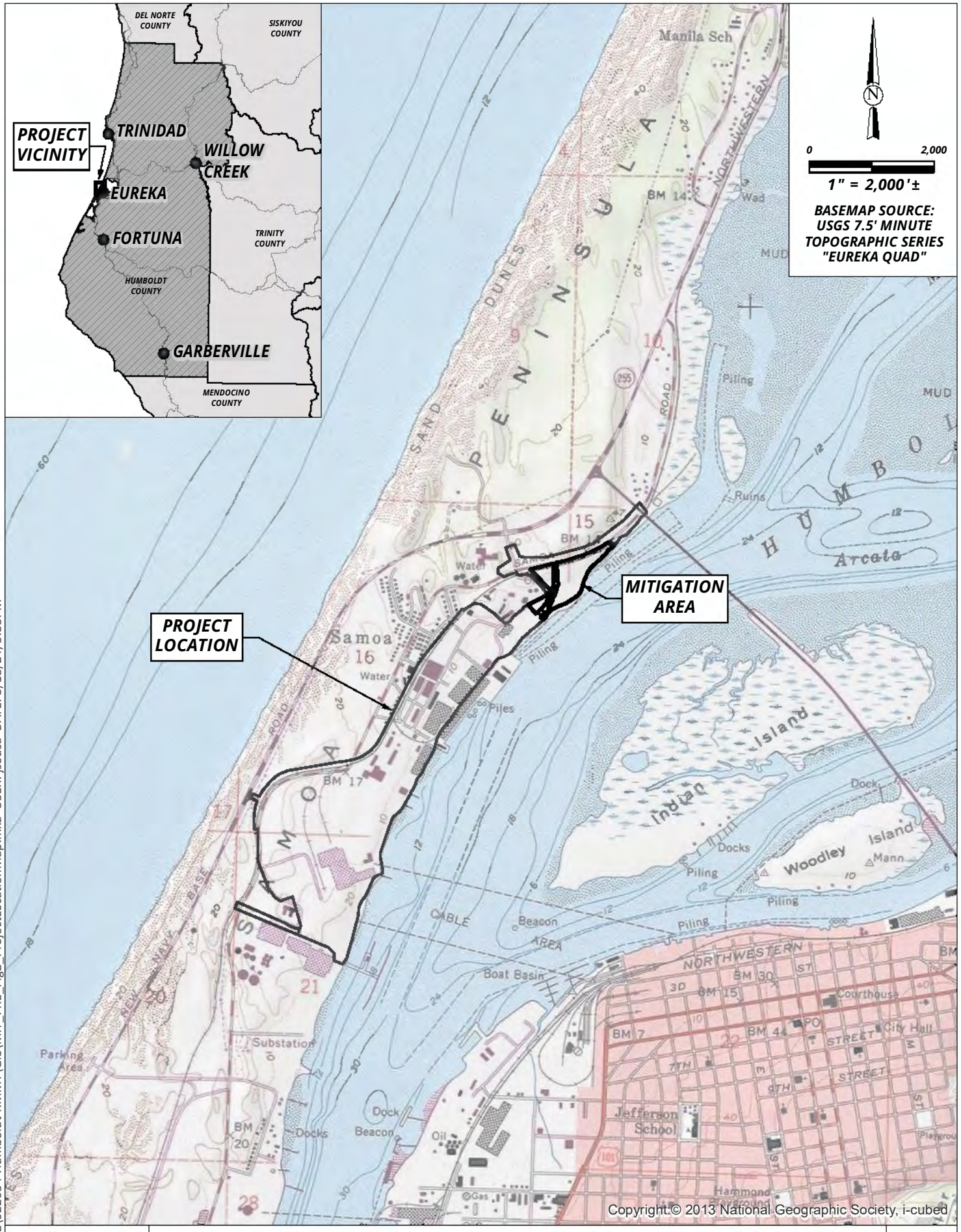
Figure 1



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Humboldt Bay Harbor, Rec., & Cons. District
Humb. Bay Offshore Wind Heavy Lift Marine Terminal
Eureka, California

Project Location Map

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Figure 2

[a] Acreage calculations are based on square footage of each feature and may not add up due to rounding error.

The project will impact a wide range of wetlands and other aquatic features as shown in Table 1. The majority of the wetlands to be impacted by the project are degraded features resulting from past industrial development and subsequent abandonment, however there are some intact wetland features that will be impacted by the project, especially Estuarine and Palustrine Forested wetland areas. Wetlands and waters potentially impacted by the project include:

- 0.052 acres of Estuarine wetlands
- 0.066 acres of Palustrine Emergent wetlands
- 0.203 acres of Palustrine Scrub-shrub wetlands
- 0.082 acres of Palustrine Forested wetlands
- 0.552 acres of artificial aquatic features
- 0.230 acres of artificial coastal aquatic features
- 0.470 acres of other coastal aquatic features

The wetlands and other aquatic features are described in detail within the Federal Aquatic Resources Delineation (SHN, 2023) and the State Aquatic Resources Delineation (SHN, 2024a), including wetland characteristics, habitat conditions, level of disturbance, total area, and an assessment of hydrologic connectivity.

Proposed mitigation ratios for impacts to non-wetland ESHA are described in Section 4.1 and are based on the criteria described in the Mitigation Ratio checklist worksheets included in Appendix 1.

3.2 Impacts to Non-Aquatic ESHA

A summary of non-wetland ESHA likely to be impacted by the Proposed Project are included in Table 2 below:

Table 2. Non-wetland ESHA Potentially Impacted by the Project

ESHA Resource Type	Total Impact Area (Acres)
coastal dune willow-Sitka willow thickets	2.608
wax myrtle scrub	0.512
mid-high elevation salt marsh	0.189
beach pine forest and woodland	0.124
shining willow groves	0.549
seaside woolly sunflower-seaside daisy-buckwheat patches	0.204
low elevation salt marsh (spartina and salt grass dominant	0.023
pickleweed mats	0.109
soft and western rush-sedge marshes	0.018
slough sedge-water parsley-small-fruited bulrush marsh	0.014
dune remnant	0.115
Total Non-wetland ESHA Potentially Impacted by the Project:	**4.465**

The project will impact a wide range of non-aquatic ESHA as shown in Table 2. The habitat value of these non-wetland ESHA vary, from highly functional sensitive natural communities that are a part of a mosaic of habitat types, to impacted, fragmented examples of sensitive vegetation communities whose occurrences are more a result of past disturbance rather than habitat conditions. The non-wetland ESHA are described in detail within the Terrestrial Biological Report for the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal (SHN, 2024b), including dominant and associated species, level of disturbance, total area, and an assessment of habitat conditions.

Proposed mitigation ratios for impacts to non-wetland ESHA are described in Section 4.2 and are based on accepted mitigation ratios for impacts to sensitive vegetation communities in the north coast region.

4.0 Proposed Project Mitigation Requirements

4.1 Mitigation Requirements for Impacts to Aquatic Resources

Appropriate baseline compensatory mitigation ratios for impacts to aquatic resources were determined using the U.S. Army Corps of Engineers (USACE) South Pacific Division (SPD) regional compensatory mitigation and monitoring guidelines (USACE, 2016) and the SPD's Quality Management System (QMS) document 12501.6, an excel worksheet used to calculate required compensatory mitigation ratios. In addition, QMS documents 12501.2, 12501.3, and 12501.5, the SPD's worksheet instructions, worksheet examples, and worksheet training presentation, respectively, which can be found on the USACE South Pacific Division website.

QMS excel spreadsheet 12501.6 makes use of qualitative, or quantitative, functional analysis to determine the functional lift of the proposed mitigation in comparison to the resource impact site. Estimation of compensatory mitigation ratios were performed by comparing wetland function of the manipulated aquatic features to be impacted with the proposed mitigation effort. Estimation efforts include an assumption of a lag time between the initiation of the wetland creation and the development of wetland habitat. This method of mitigation ratio determination was utilized as a starting point for the estimate of compensatory wetland creation. In addition to these methods, quality of wetland habitat to be impacted by the project was considered, as well as the historical regional loss of wetland habitat and the interaction of the aquatic features to be impacted, with the greater habitat mosaic of the Humboldt Bay area, which resulted in greater replacement ratios than those developed using the QMS excel spreadsheet 12501.6. The baseline mitigation ratio estimate using the QMS excel spreadsheet 12501.6 is shown in Table 3, as well as the adjusted mitigation ratios that take historical wetland habitat loss into consideration.

These estimates and methods are being provided to assist regulatory agencies in the determination of compensatory mitigation required for this project and are seen as a starting point in the process of developing suitable mitigation for the impacts to aquatic resources associated with the Proposed Project. Proposed mitigation ratios and resultant compensatory wetland creation are shown in Table 3.

Table 3. Aquatic Resource Impacts and Mitigation Ratios

Aquatic Resource Type	Total Impact Area to be mitigated (Acres)	Baseline Mitigation Ratio	Baseline Wetland Creation Acreage	Proposed Mitigation Ratio	Proposed Wetland Creation Acreage
Estuarine Wetlands	0.052	4.10:1	0.21	5:1	0.26
Palustrine Emergent	0.066	2.00:1	0.13	3:1	0.20

Aquatic Resource Type	Total Impact Area to be mitigated (Acres)	Baseline Mitigation Ratio	Baseline Wetland Creation Acreage	Proposed Mitigation Ratio	Proposed Wetland Creation Acreage
Palustrine Scrub-shrub	0.203	2.36:1	0.48	3.1:1	0.62
Palustrine Forested	0.082	2.36:1	0.19	4:1	0.32
Artificial Aquatic Features	0.552	1.63:1	0.90	1.63:1	0.90
Coastal Aquatic Features	0.700	1.73:1	1.21	2.71:1	1.90
Total Aquatic Resources Potentially Impacted by the Project:	**1.655**	**1.89:1**	**3.12**	**2.54:1**	**4.20**

Three-parameter Wetland Mitigation Ratios

An estimated 0.403 acres of three parameter wetlands will be permanently impacted by the project as described in Section 3.1 and Table 1. Permanent wetland impacts will be mitigated using a habitat and wetland quality-based replacement ratio. The wetland ratios and rational behind the proposed wetland mitigation ratio is described below by wetland type.

Estuarine Wetlands

An estimated 0.052 acres of Estuarine wetlands may be impacted by the Proposed Project. Estuarine wetlands to be impacted by the project represent some of the highest quality wetland potentially impacted by the project. All Estuarine wetlands within the project area are associated with Humboldt Bay and are tidally influenced, and all Estuarine wetlands potentially impacted by the Proposed Project have a history of disturbance. In spite of this, the highest quality example of Estuarine wetlands impacted by the project supports a diverse assemblage of salt marsh vegetation, including the seacoast angelica (*Angelica lucida*), a special-status species, however most of the impacted Estuarine wetland area is dominated by dense flowered cordgrass (*Spartina densiflora*).

A compensatory mitigation ratio of 4.10:1 was determined to be a suitable baseline mitigation ratio for impacts to Estuarine wetlands using the above methods (see Appendix 1 for QMS document 12501.6 excel worksheet for Estuarine wetlands). Using this replacement ratio, the 0.052 acres of impacts would require the creation of 0.21 acres of high-quality Estuarine wetland habitat. Historic Estuarine habitat loss and temporal impacts justify a higher mitigation ratio of 5:1, which would result in the creation of 0.26 acres of Estuarine wetlands as shown in Table 3. The higher replacement ratio reflects the higher quality habitat found in the Estuarine habitat to be impacted by the Proposed Project.

Palustrine Emergent Wetlands

An estimated 0.066 acres of Palustrine Emergent Wetlands may be impacted by the Proposed Project. Palustrine Emergent wetlands to be impacted by the Proposed Project are highly manipulated, with a large component of non-native species. All Palustrine Emergent Wetlands within the impact area are considered human-induced and have a history of creation by human activities, specifically industrial development, and its subsequent demolition (SHN, 2023 and 2024b). These locations occur on compacted gravel and are regularly mowed, which has prevented the growth of woody vegetation.

A compensatory mitigation ratio of 2.00:1 was determined to be a suitable baseline mitigation ratio for impacts to Palustrine Emergent wetlands using the above methods (see Appendix 1 for QMS document

12501.6 excel worksheet for Palustrine Emergent Wetlands). Using this replacement ratio, the 0.066 acres of impacts would require the creation of 0.13 acres of high-quality Palustrine Emergent wetland habitat. Historic Palustrine Emergent habitat loss and temporal impacts justify a higher mitigation ratio of 3:1 which would result in the creation of 0.2 acres of Palustrine Emergent wetlands as shown in Table 3. The lower replacement ratio reflects the degraded habitat found in the Palustrine Emergent wetlands to be impacted by the Proposed Project, compared to the high quality Palustrine Emergent wetland habitat to be created.

Palustrine Scrub-shrub Wetlands

An estimated 0.203 acres of Palustrine Scrub-shrub Wetlands may be impacted by the Proposed Project. Palustrine Scrub-shrub wetlands to be impacted by the Proposed Project have a wide range of conditions, however most are highly manipulated with degraded habitat conditions. All but one Palustrine Scrub-shrub wetlands within the impact area are considered human-induced and have a history of creation by human activities, specifically industrial development, and its subsequent demolition (SHN, 2023 and 2024b). These locations occur on a wide range of artificial substrates, reflecting past development, and most are willow-dominated with a mix of native and non-native species in the understory. There is a wide range of connectivity between the Palustrine Scrub-shrub wetlands, however most are isolated within large expanses of asphalt and concrete or ruderal vegetation.

A compensatory mitigation ratio of 2.36:1 was determined to be a suitable baseline mitigation ratio for impacts to Palustrine Scrub-shrub wetlands using the above methods (see Appendix 1 for QMS document 12501.6 excel worksheet for Palustrine Scrub-shrub Wetlands). Using this replacement ratio, the 0.203 acres of impacts would require the creation of 0.48 acres of high-quality Palustrine Scrub-shrub wetland habitat. Historic Palustrine Scrub-shrub habitat loss and temporal impacts justify a higher mitigation ratio of 3.1:1 which would result in the creation of 0.62 acres of Palustrine Scrub-shrub wetlands as shown in Table 3. The lower replacement ratio reflects the degraded habitat found in the Palustrine Scrub-shrub wetlands to be impacted by the Proposed Project, compared to the high-quality Palustrine Scrub-shrub wetland habitat to be created.

Palustrine Forested Wetlands

An estimated 0.082 acres of Palustrine Forested Wetlands may be impacted by the Proposed Project. Palustrine Forested wetlands to be impacted by the Proposed Project are highly manipulated with a large component of non-native species. All of the Palustrine Forested Wetlands within the study area have been significantly altered by human activities. (SHN, 2023 and 2024b). These locations occur on a wide range of artificial substrates reflecting past development, and most are willow-dominated with a mix of native and non-native species in the understory, often with a significant Himalayan blackberry component.

A compensatory mitigation ratio of 2.36:1 was determined to be a suitable baseline mitigation ratio for impacts to Palustrine Forested wetlands using the above methods (see Appendix 1 for QMS document 12501.6 excel worksheet for Palustrine Forested Wetlands). Using this replacement ratio, the 0.082 acres of impacts would require the creation of 0.19 acres of high-quality Palustrine Forested wetland habitat. Historic Palustrine Forested habitat loss and temporal impacts justify a higher mitigation ratio of 4:1, which would result in the creation of 0.32 acres of Palustrine Forested wetlands as shown in Table 3.

Artificial Aquatic Features

An estimated 0.552 acres of artificial aquatic features may be impacted by the Proposed Project. Artificial aquatic features were either constructed to hold, capture, or convey surface water and stormwater, or are the direct result of human disturbance and development activities and have little development of wetland habitat. This includes a rectangular concrete-lined foundation with willow growth in the north central portion of the study area, several rectangular depressions with gravelly soils between concrete foundations of former drying sheds in the north central portion of the study area, and a linear stormwater feature in the south-central portion of the study area, all of which are described in the federal and state aquatic resource delineations conducted for the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal (SHN, 2023 and 2024a). These locations occur on a wide range of artificial substrates, reflecting past development and are willow- or herbaceous-dominated, with a mix of native and non-native species and do not meet the criteria for a Cowardin classification. There is a wide range of connectivity between the artificial aquatic features reflecting their past uses in the former industrial development and all are located within large expanses of asphalt and concrete or ruderal vegetation.

A compensatory mitigation ratio of 1.63:1 was determined to be a suitable baseline mitigation ratio for impacts to artificial aquatic features using the above methods (see Appendix 1 for QMS document 12501.6 excel worksheet for Artificial Aquatic Features). Using this replacement ratio, the 0.552 acres of impacts would require the creation of 0.90 acres of high-quality Estuarine wetland habitat. This replacement ratio was determined to be adequate in mitigating for impacts to the degraded artificially-induced habitat found in the artificial aquatic features to be impacted by the Proposed Project, compared to the high-quality Estuarine wetland habitat to be created.

Coastal Aquatic Features

An estimated 0.700 acres of coastal aquatic features may be impacted by the Proposed Project. Coastal aquatic features potentially impacted by the project include areas that exhibit only one or two of the three parameters required by the USACE and have normal conditions present, though they are all human induced. These areas may have functions related to wetlands or are areas in which the California Coastal Act (CCA) may require further investigation. This includes areas with hydrophytic vegetation dominance adjacent to other wetlands which may represent an extension of wetland habitat, areas with wetland hydrology that may or may not have hydrophytic vegetation or hydric soil development, and areas with wetland hydrology and hydrophytic vegetation, but lack hydric soils due to transitory hydrology, or other factors all of which are described in the state aquatic resource delineations conducted for the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal (SHN, 2023 and 2024a). These features do not meet the criteria for a Cowardin classification due to the lack of key wetland indicators.

A compensatory mitigation ratio of 1.73:1 was determined to be a suitable baseline mitigation ratio for impacts to coastal aquatic features using the above methods (see Appendix 1 for QMS document 12501.6 excel worksheet for Coastal Aquatic Features). Using this replacement ratio, the 0.700 acres of impacts would require the creation of 1.21 acres of high-quality Estuarine and palustrine wetland, and wetland fringe habitat. Temporal impacts to coastal aquatic features justify a higher mitigation ratio of 2.71:1, which would result in the creation of 1.9 acres of coastal aquatic features, as shown in Table 3. The lower replacement ratio reflects the degraded artificially-induced habitat found in the coastal aquatic features to be impacted by the Proposed Project, compared to the high-quality wetland habitat to be created.

In total, 1.655 acres of aquatic features may be impacted by the Proposed Project, with a wide range of conditions from completely artificial features to intact Estuarine wetland habitat. To mitigate for these impacts using the above mitigation ratios, a baseline total of 3.12 acres of wetland creation is needed to mitigate for the loss of wetland habitat associated with the Proposed Project and to ensure that there is no net loss of wetlands as a result of the Proposed Project. The creation of 3.12 acres of wetlands for the loss of 1.655 acres results in a total proposed baseline mitigation ratio of 1.89:1. Historic wetland loss and temporal impacts to wetlands justify a higher mitigation ratio of 2.54:1, which would result in the creation of 4.2 acres of wetlands and coastal wetlands as shown in Table 3. See Table 3 for a summary of wetland impacts, mitigation ratios, and baseline mitigation ratios. These higher mitigation ratios were used to design the conceptual wetland mitigation plan described in Section 6.0.

4.2 Mitigation Requirements for Impacts to Non-wetland ESHA

Appropriate baseline compensatory mitigation ratios for impacts to non-wetland ESHA were determined using accepted mitigation ratios used in similar situations within the Humboldt Bay Area, which is typically a 3:1 replacement ratio for permanent impacts to sensitive vegetation communities. Estimation of compensatory mitigation ratios were performed by comparing habitat quality of the ESHA features to be impacted with the habitat creation proposed as part of the mitigation effort. Estimation efforts include an assumption of a lag time between the initiation of the habitat creation and the development of high-quality habitat conditions. This method of mitigation ratio determination was utilized as a starting point for the estimate of compensatory ESHA creation. In addition, historical regional loss of sensitive habitat as well as the interaction of habitat fragments within the context of the larger landscape of the Humboldt Bay area were used to determine suitable replacement ratios and mitigation locations.

Eleven distinct types of non-wetland ESHA will be impacted by the Proposed Project as shown in Table 2. Estimated impacts to non-wetland ESHA totals 4.465 acres, which includes impacts to each of the 11 types of non-wetland ESHA as shown in Table 2. Many of the impacts to non-wetland ESHA are small (0.014 acres or similar) and a direct 3:1 replacement ratio of each non-wetland ESHA type would not be the most efficient or effective way to preserve habitat or mitigate for impacts to sensitive natural communities. As such, compensatory mitigation for impacts to non-wetland ESHA was determined using the total impact of 4.465 acres and multiplying by 3 for a 3:1 replacement ratio, which results in a total mitigation requirement of 13.4 acres.

These estimates and methods are being provided to assist regulatory agencies in the determination of compensatory mitigation required for this project and are seen as a starting point in the process of developing suitable mitigation for the impacts to non-wetland ESHA resources associated with the Proposed Project. This conceptual mitigation plan does not attempt to address all impacts to non-wetland ESHA resulting from the Proposed Project. The onsite mitigation area does not have enough area or suitable locations for the creation of 13.4 acres of sensitive natural communities. This conceptual mitigation plan addresses a portion of the mitigation requirements as described in Section 6, and outlines the remaining mitigation needs to mitigate for impacts to non-wetland ESHA resulting from the Proposed Project.

5.0 Mitigation Goals

The goals of this conceptual mitigation plan are to:

1) Develop a conceptual mitigation plan to mitigate for wetland impacts resulting from the proposed Humboldt Bay Offshore Wind Heavy Lift Terminal Project by:
    a. creating new high-quality tidally-influenced Estuarine wetland habitat along Humboldt Bay within the vicinity of the project,
    b. creating new, high-quality freshwater wetland habitat along Humboldt Bay within the vicinity of the project, and
    c. creating new, high-quality coastal wetland habitat along the fringes of the Estuarine and freshwater wetlands.
2) Develop a conceptual mitigation plan to create sensitive natural communities throughout the mitigation area to create a mosaic of high-quality habitat adjacent to Humboldt Bay and mitigate for some of the impacts to sensitive natural communities resulting from the Proposed Project,
3) Develop a conceptual plan to restore/enhance existing sensitive natural communities within the mitigation area to create a mosaic of functional high-quality habitat through the removal of invasive species and planting of native understory species,
4) Develop a conceptual framework for a long-term maintenance and management plan to ensure that created and restored habitat quality remains high and free from invasive species, and
5) Create five Osprey nesting platforms to address the loss of osprey nesting locations resulting from the project.

Specifically proposed is the following: 1.886 acres of Estuarine wetland creation including 0.508 acres of channel, 1.212 acres of freshwater wetland creation, 1.103 acres of coastal wetlands along the perimeter of the Estuarine and freshwater wetlands, 2.664 acres of sensitive natural community creation, and 4.411 acres of sensitive natural community restoration/enhancement.

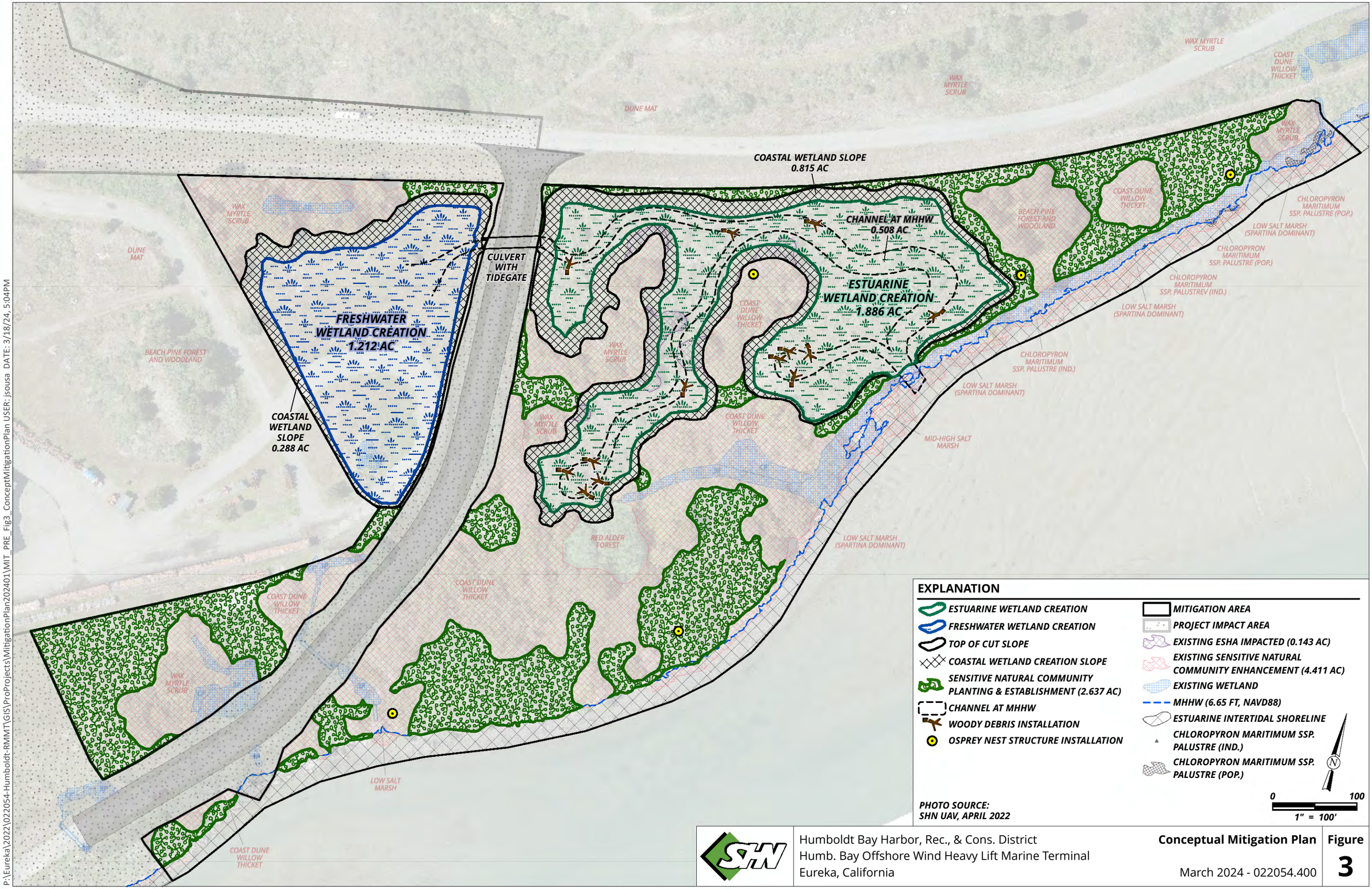
See Section 6.0 Mitigation Plan for the conceptual mitigation plan details including existing conditions and Figure 3.

6.0 Mitigation Plan

6.1 Proposed Mitigation Area Existing Conditions

The proposed mitigation area (see Figure 2 for mitigation area location) is currently characterized by a mix of habitat, from invasive-dominated regions to marginal sensitive natural communities, mapped as ESHA (Figure 4). Vegetation communities and wetland conditions within the proposed mitigation area were mapped during the Federal and State aquatic resources delineations, and the surveys and mapping efforts for the Terrestrial Biological Report completed for the project. The results of these studies for the mitigation area are shown on Figure 4 and a few representative photos are included in Appendix 2, Photos 3-5.

Wetlands occurring within the mitigation area include Estuarine wetlands along Humboldt Bay, four distinct coastal aquatic features, three distinct Palustrine Forested wetlands, and four distinct Palustrine Scrub-shrub wetlands. All but two of these features will be avoided by the proposed mitigation plan.



EXPLANATION

- ESTUARINE WETLAND CREATION
- FRESHWATER WETLAND CREATION
- TOP OF CUT SLOPE
- COASTAL WETLAND CREATION SLOPE
- SENSITIVE NATURAL COMMUNITY PLANTING & ESTABLISHMENT (2.637 AC)
- CHANNEL AT MHHW
- WOODY DEBRIS INSTALLATION
- OSPREY NEST STRUCTURE INSTALLATION
- MITIGATION AREA
- PROJECT IMPACT AREA
- EXISTING ESHA IMPACTED (0.143 AC)
- EXISTING SENSITIVE NATURAL COMMUNITY ENHANCEMENT (4.411 AC)
- EXISTING WETLAND
- MHHW (6.65 FT, NAVD88)
- ESTUARINE INTERTIDAL SHORELINE
- CHLOROPYRON MARITIMUM SSP. PALUSTRE (IND.)
- CHLOROPYRON MARITIMUM SSP. PALUSTRE (POP.)

N

0 100

1" = 100'

PHOTO SOURCE:
SHN UAV, APRIL 2022

Humboldt Bay Harbor, Rec., & Cons. District
Humb. Bay Offshore Wind Heavy Lift Marine Terminal
Eureka, California

Conceptual Mitigation Plan

March 2024 - 022054.400

Figure 3

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VANCE AVE

R1

R2

R5

WILDLIFE TRAIL

HUMBOLDT BAY

EXPLANATION

ESHA

- COASTAL DUNE WILLOW-SITKA WILLOW THICKETS (R2,5,8,10) (2.435 AC)
- WAX MYRTLE SCRUB (R1,11) (1.174 AC)
- BEACH PINE FOREST AND WOODLAND (R6) (0.270 AC)
- LOW ELEVATION SALT MARSH (SPARTINA AND SALT GRASS DOMINANT) (0.271 AC)
- MID-HIGH SALT MARSH (R4,7) (0.354 AC)

NON-ESHA

- RED ALDER FOREST (0.161 AC)
- HIMALAYAN BLACKBERRY SCRUB (1.961 AC)
- NON-NATIVE GRASSLAND (3.365 AC)
- RUDERAL VEGETATION (1.200 AC)
- CONCRETE/ASPHALT SURFACE (0.313 AC)

SPECIAL STATUS PLANT SPECIES OCCURRENCES

- CHLOROPYRON MARITIMUM SSP. PALUSTRE (IND.)
- CHLOROPYRON MARITIMUM SSP. PALUSTRE (POP.)

- MITIGATION AREA
- PROJECT IMPACT AREA
- ESTUARINE WETLAND (0.310 AC)
- PALUSTRINE EMERGENT WETLAND (0.000 AC)
- PALUSTRINE FORESTED WETLAND (0.105 AC)
- PALUSTRINE SCRUB-SHRUB WETLAND (0.085 AC)
- COASTAL FEATURE (0.079 AC)
- ESTUARINE INTERTIDAL SHORELINE (1.125 AC)
- TEST PIT (3-PARAMETER)
- TEST PIT (2-PARAMETER)
- TEST PIT (1-PARAMETER)
- UPLAND TEST PIT
- DRAINAGE INLET
- CULVERT
- VEGETATION RA POINT

N

0 100

1" = 100'

PHOTO SOURCE: SHN UAV, APR. 2022

Humboldt Bay Harbor, Rec., & Cons. District
Humb. Bay Offshore Wind Heavy Lift Marine Terminal
Eureka, California

Existing Conditions within Mitigation Area

March 2024 - 022054.400

Figure 4

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One small Palustrine Scrub-shrub wetland totaling 0.016 acres will be impacted during the implementation of this mitigation plan. Additionally, 0.007 acres of Estuarine wetlands will be temporarily impacted during the implementation of this plan for the development of a slough channel through the Estuarine wetland to establish connectivity between the created wetlands and Humboldt Bay.

Wetlands within the mitigation area are of slightly better quality than other wetlands within the study area due to the longer time period of abandonment, as detailed in the Aquatic resource delineations; however they are still characterized by fill substrates, non-native and invasive species in the understory, and in many cases are artificially-induced as a result of past industrial development. Estuarine wetlands along Humboldt Bay in the mitigation area are high quality and support special-status salt marsh species and sensitive salt marsh habitat.

Sensitive vegetation communities within the mitigation area include coast dune willow-Sitka willow thickets, wax myrtle scrub, beach pine forest and woodland, low-elevation salt marsh, and mid-high elevation salt marsh. Sensitive natural communities within the mitigation area occupy approximately 4.5 acres, with most of this being coast willow-Sitka willow thickets. Nearly all of the sensitive natural communities in the mitigation area will be avoided during the implementation of this plan, however some minor impacts are unavoidable. This includes 0.080-acre of impacts to wax myrtle scrub, 0.049-acre of impacts to coast dune willow-Sitka willow scrub for construction of a functional saltmarsh, and 0.008-acre of impacts to low-elevation salt marsh and 0.005-acre of impacts to mid-high elevation salt marsh for the development of a slough channel through the salt marsh habitat to establish connectivity between the created wetlands and Humboldt Bay.

Habitat quality of the sensitive vegetation communities occurring within the mitigation area is limited, reflecting the history of disturbance and high level of invasive cover throughout the area. Much of the wax myrtle scrub and coast dune willow-Sitka willow thickets are impassible because of thick Himalayan blackberry cover that has developed into a monodominant understory and often extends into the canopy of the willow or wax myrtle. Portions of wax myrtle scrub and coast dune willow-Sitka willow thickets have concrete pads, or concrete debris scattered throughout the understory, especially within the vicinity of the current access road. The beach pine forest and woodland has a range of pine ages, but is mostly younger, suggesting long-term viability of this occurrence. While conducting surveys, an unsanctioned houseless encampment was observed within the beach pine forest and woodland, greatly reducing the habitat value with abundant garbage, tarps, and a dog present.

The remaining mitigation area is characterized by upland non-native grassland, ruderal vegetation, and large Himalayan blackberry thickets. These highly manipulated, invasive species-dominated areas occupy approximately 6.7 acres of the mitigation area. All of these areas will be removed and altered for the implementation of this mitigation plan. Non-native grassland within the mitigation area occurs on gravelly fill with some top soil and is dominated by non-native and invasive species including sweet vernal grass (*Anthoxanthum odoratum*), velvet grass (*Holcus lanatus*), large quaking grass (*Briza maxima*), six-weeks grass (*Festuca myuros*), wild oat (*Avena barbata*), sheep sorrel (*Rumex acetosella*), subterranean clover (*Trifolium subterraneum*), coyote brush (*Baccharis pilularis* ssp. *consanguinea*), and yellow bush lupine (*Lupinus arboreus*), among others, with a small contingent of native species. Portions that are mowed yearly have little to no woody vegetation cover, however portions that are mostly un-mowed display an increasing cover by coyote brush and yellow bush lupine.

Ruderal vegetation-dominated areas occur on gravelly fill, often with little to no topsoil, and is dominated by a diverse array of non-native and invasive species. Common species observed included Himalayan blackberry with lower cover, hairy vetch (*Vicia villosa* ssp. *villosa*), yellow bush lupine, large quaking grass, and yellow glandweed (*Parentucellia viscosa*). Soils were highly compacted, but well drained if sloping with upland conditions present.

Himalayan blackberry thickets within the mitigation area are characterized by dense Himalayan blackberry cover to the exclusion of most other species. These areas were located on fill, with well drained often loose topsoils. The Himalayan blackberry thickets within the mitigation area occur along the edges of other vegetation communities, such as wax myrtle scrub or coast dune willow-Sitka willow thickets, or they are discrete areas where the Himalayan blackberry thickets can be over three meters tall.

Historic Use

The study area, including the mitigation site, was used intensively for industrial lumber mill operations for approximately 100 years, resulting in a wide range of conditions and different iterations of use over that period. Historic use of the mitigation area varied, but it appears that the area was initially used as a rail yard and log dump, with the shoreline and intertidal areas used for log storage, as shown in Photo 1 in Appendix 2. The railyard was likely part of the timber railroad, and railroad maintenance and machine shop that operated just north of the mitigation area, which is now the home of the Timber Heritage Society. Georgia Pacific shifted all log hauls to trucks in 1961, bringing the logging railroad era to a close. The tracks were removed, and the Roundhouse and surrounding area was converted to a truck maintenance shop (Timber Heritage Association, 2024). Fill placement likely dates back to the railroad operations and some amount of Estuarine wetlands were filled for this development, however it is unknown what the extent of Estuarine wetlands were onsite prior to fill placement. Later imagery from 1983 shows the mitigation area mostly devoid of vegetation, appearing to be a gravel area used for truck maintenance, storage, and staging of equipment (Photo 2 in Appendix 2). Current conditions reflect the configuration of the site seen in the 1983 aerial imagery and intervening years of disuse.

6.2 Conceptual Mitigation Plan

A total of 1.886 acres of Estuarine wetland creation including 0.508 acres of channel, 1.212 acres of freshwater wetland creation, and 1.103 acres of coastal wetlands along the perimeter of the Estuarine and freshwater wetlands are proposed to mitigate for impacts to wetlands resulting from the proposed Humboldt Bay Heavy Lift Marine Terminal project. These conceptual wetland creation plans are shown on Figure 3 and are discussed below.

6.2.1 Estuarine Wetland Creation Area

Estuarine wetland creation is proposed to mitigate for impacts to wetlands occurring as a result of the Project (Figure 3). A total of 1.886 acres of Estuarine wetland creation is proposed. A high percentage of the proposed wetland creation will be Estuarine, reflecting the historic loss of Estuarine wetlands in the Humboldt Bay area. It is likely that large areas of the study area included Estuarine wetlands in the past, prior to the historic industrial development of the area. The creation of Estuarine wetlands attempts to address the historic loss of Estuarine wetlands, while mitigating for the loss of degraded wetland habitat as a result of the Proposed Project. While creation of Estuarine wetland is not a direct in-kind replacement, the freshwater wetland creation described in Section 5.2.2 will address freshwater wetland loss resulting from the Proposed Project.

The proposed wetland mitigation site is well suited for the development of freshwater and brackish Estuarine wetlands. It represents one of the lowest elevations in the study area, necessitating far less material removal during the wetland creation activities. It also has large areas of compacted soils that do not support sensitive natural communities or wetlands. Lastly, it is directly adjacent to Humboldt Bay, offering direct habitat connectivity and the potential for hydrologic connectivity and creation of tidally-influenced wetlands.

Estuarine wetland creation will consist of excavating an area that is currently upland fill to suitable depths to allow for the development of Estuarine wetland hydrology and establishment of native salt marsh vegetation. An area of 2.7 acres will be excavated and recontoured to create the suitable wetland conditions (Figure 3). This will include 1.886 acres of Estuarine wetlands, of which 1.378 acres would be relatively flat salt marsh and 0.508 acres would be channel. Additionally, the slope surrounding the salt marsh would include 0.815 acre of coastal wetland, which will be described in Section 6.2.3. In general, the salt marsh portion of the Estuarine wetland will be excavated to a depth of 6 feet, which is below the current Mean Higher High Water elevation (MHHW) of 6.65 feet, with a gentle slope to up an elevation of 8.5 feet. The salt marsh portion of the slope angle will vary, however large areas will have slopes of around 1-2% to minimize water movement and facilitate sediment deposition, and other areas will have slightly greater slopes depending on topography and design constraints. The gentle slope will facilitate sediment deposition, and the range of salt marsh elevations up to 8.5 feet will allow for the upward migration of salt marsh habitat in the immediate future, with additional area available in the coastal wetland slopes surrounding the Estuarine wetlands.

The current conceptual design is anticipated to accommodate sea level rise (SLR), and any final design will be fine-tuned to better adapt to predicted SLR scenarios. The California Coastal Commission (CCC) draft sea-level rise policy guidance document (California Sea Level Rise Guidance, 2024) was used to estimate the amount of SLR that may occur in the project site so that the effects could be evaluated for the proposed mitigation area. This document and estimated SLR scenarios include SLR rates for the North Spit that takes into account subsidence and other tectonic activity that makes the Humboldt Bay area more susceptible to SLR than elsewhere on the northern California coastline. These scenarios and SLR rates are included in Appendix 3. The current conceptual design has worked in an estimated 2.5 feet of elevation for sea level rise adaptation for salt marsh. This will allow salt marsh conditions to persist in the main body of the Estuarine wetland to at least the year 2060, where worst case scenarios predict 2.4 feet of SLR (see Table in Appendix 3), or more likely to the year 2080 where intermediate SLR rates would lead to 2.5 feet of SLR (see Table in Appendix 3; California Sea Level Rise Guidance, 2024). Lowest rates of predicted SLR would see the Estuarine salt marsh habitat as designed intact through the year 2140 (California Sea Level Rise Guidance, 2024). It is unknown what levels of sediment deposition would occur within the Estuarine wetland; however, it is likely that sediment deposition could aid in longer term duration of salt marsh within the main body of the Estuarine wetland where gentle slopes will facilitate sediment deposition. Even when the predicted high range SLR values are realized, the Estuarine wetland creation would not fail or be eliminated by SLR but would rather see a shift to more inundation tolerant species. Additionally, coastal wetlands designed to fringe the Estuarine wetlands would transition to salt marsh, and these areas would represent additional SLR migration for salt marsh habitat and upper salt marsh-dependent species.

The center of the Estuarine wetland will have a shallow channel to facilitate tidal intrusion and water cycling within the created Estuarine wetland. The channel depth will likely be between 2–4-foot elevation at the thalweg, which would put it 2-4 feet below the elevation of the surrounding saltmarsh. The channel would be designed to drain during low tide and would have a slope between 1-3 percent to

prevent excessive drainage. Channel width will be 20 feet wide at the mouth but will fork into three smaller and shallower 10-foot-wide channels. This mirrors channel morphology of undisturbed channels in similar sized watersheds around Humboldt Bay. Two of the shallower channels will end in a small bulb with woody debris placement. These represent deeper water habitat areas, and the woody debris provide perches for waterfowl and protection for fish species. The main channel will connect to the freshwater wetland creation area via a culvert under the proposed access road. This channel will consequently have the freshest water and may provide tidewater gobi (*Eucyclogobius newberryi*) habitat. The channel bottom or channel end bulbs can be designed to be fully drained during low tide or can be designed to have varying depths with pooled water during low tide to provide habitat for eelgrass.

All Estuarine wetland design details are conceptual at this time. A thorough elevational survey of the mitigation area is needed to develop the final design and will inform channel locations, shape of the proposed Estuarine wetland, and final acreage, in addition to the slope and size of the surrounding coastal wetland. The above narrative is provided as a baseline and is intended to inform future wetland design activity. Final project site design and a final assessment of impacts is needed before engineered wetland design can be completed.

Vegetation Establishment

Salt marsh vegetation will be planted within the Estuarine wetland to facilitate the development of high-quality salt marsh habitat and reduce the potential for invasive dense flowered cordgrass establishment. Salt marsh vegetation planting will focus on introducing a diverse array of species into the created Estuarine wetlands. Many local salt marsh restoration projects have relied on passive introduction of native species to populate the restored salt marsh areas. While this method is highly successful for pickleweed mat and salt grass (*Distichlis spicant*) in the lower elevation salt marsh, it is less successful at establishing diverse mid-high level salt marsh habitat. As such, the implementation of salt marsh creation will include both passive and active revegetation, with lower salt marsh restoration relying almost solely on passive revegetation and mid-upper elevation salt marsh relying on active planting of specific species and passive establishment of pickleweed and salt grass. While number of individuals and specific location of planting is not described in this conceptual design, a list of suitable salt marsh species to be planted in the Estuarine wetland creation area is shown in Table 4. These species are appropriate for this location and have been observed in adjacent intact saltmarsh habitat occurring in the vicinity of the mitigation area.

Compensatory Mitigation for Salt Marsh Vegetation Impacts

The active planting and establishment of salt marsh is intended to count toward the mitigation of impacts to pickleweed mats and salt marsh habitat occurring as a result of the Proposed Project. The Proposed Project will result in permanent impacts to 0.189 acres of mid-high salt marsh, 0.109 acres of pickleweed mats, and 0.023 acres of low-elevation salt marsh, as detailed in Table 2. An estimated 1.378 acres of salt marsh will be actively planted or passively restored as part of this restoration project. Of this, 0.37 acres will likely be low-elevation salt marsh dominated by pickleweed mats and salt grass, representing over a greater than 3:1 replacement ratio for impacts to low-elevation salt marsh and pickleweed mats. An estimated 1 acre will be mid-high elevation salt marsh. This area will include pickleweed mats, but will also be actively planted with a wide range of native salt marsh species as shown in Table 4. This represents a 5.2:1 replacement ratio for impacts to salt marsh habitat. See Table 8 for a breakdown in sensitive natural community mitigation credits for the entire mitigation area addressed in this conceptual plan.

Table 4. Suggested salt marsh species for planting within created Estuarine wetlands

Scientific Name	Common Name	Planting Elevation
Angelica lucida	seacoast angelica	high 8.5+ feet
Baccharis glutinosa	saltmarsh baccharis	high: 7.5-8.5+ feet
Carex lyngbyei	Lyngbye's sedge	low, channel edge: 5.5-7 feet
Castilleja ambigua var. *humboldtiensis*	Humboldt Bay owl's clover	mid: 6.5-8 feet
Chloropyron maritimum	Pt. Reyes bird's beak	mid: 6.5-8 feet
Deschampsia caespitosa ssp. *holciformes*	coast tufted hairgrass	mid-high: 6.8-8.5+ feet
Euthamia occidentalis	western goldenrod	high: 8+ feet
Festuca rubra ssp. *pruinosa*	coastal red fescue	high: 8-8.5+ feet
Grindelia stricta	gumweed	high: 7.5-8.5+ feet
Jaumea carnosa	marsh jaumea	low-mid: 6-7.5 feet
Juncus lescurii	dune rush	high: 7.5-8.5 feet
Limonium californicum	marsh rosemary	mid: 6.5-7.5 feet
Plantago maritima	maritime plantain	mid: 6.5-7.5 feet
Plantago subnuda	coastal plantain	high: 7.5-8.5
Schoenoplectus americanus	chairmakers bulrush	mid: 6.5-7.5 feet
Scrophularia californica	California bee plant	high: 8+ feet
Spergularia canadensis var. *occidentalis*	northern sandspurrey	low-mid: 6.5-7.5 feet
Spergularia marina	salt sand spurrey	mid-high: 7-8.5 feet
Stachys chamissonis	hedgenettle	high: 8+ feet
Symphyotrichum chilense	Pacific aster	high: 8+ feet
Triglochin maritima	seaside arrowgrass	mid: 6.5-8 feet

6.2.2 Freshwater Wetland Creation Area

Freshwater wetland creation is proposed to mitigate for impacts to wetlands occurring as a result of the Project (Figure 3). A total of 1.212 acres of freshwater wetland creation is proposed. The freshwater wetland will be a mix of Palustrine Emergent, Palustrine Scrub-shrub, and Palustrine Forested wetlands, reflecting the mosaic of freshwater wetlands impacted by the Proposed Project. It is likely that Palustrine Emergent wetlands will over time transition to Palustrine Scrub-shrub or Palustrine Forested wetlands. The creation of a freshwater wetland mosaic attempts to address the historic loss of freshwater wetlands along the Samoa Peninsula, while mitigating for the loss of degraded wetland habitat as a result of the Proposed Project.

The proposed wetland mitigation site is well suited for the development of freshwater wetlands. It represents one of the lowest elevations in the study area, necessitating far less material removal during the wetland creation activities. It also has large areas of well-drained soils that do not support sensitive natural communities or wetlands. Lastly, a Palustrine Forested wetland occurs immediately northwest of the proposed freshwater creation area, indicating that freshwater wetland creation is possible in this location and gives the proper depth of excavation for the development of wetland hydrology.

The freshwater wetland creation area is located west of the proposed Estuarine creation area (Figure 3). The north access road for the Proposed Project will separate the freshwater wetland area from the Estuarine wetland. The freshwater wetland will be hydrologically connected to the Estuarine wetland via a culvert under the Proposed Project access road. This culvert may or may not have a tide gate on it, depending on the depth needed to create freshwater wetlands at this location. Other freshwater

wetlands in the vicinity area located between an 8- and 10-foot elevation, and it is assumed that this would be the elevation of the freshwater wetland. It is recommended that a tidegate be installed so that freshwater conditions are ensured, however final plans may dictate otherwise.

Freshwater wetland creation will consist of excavating an area that is currently upland fill to suitable depths to allow for the development of freshwater wetland hydrology and establishment of native hydrophytes. An area of 1.5 acres will be excavated and recontoured to create the suitable wetland conditions. This will include 1.212 acres of freshwater wetlands and the slope surrounding the freshwater wetlands would include 0.288 acre of coastal wetland, which will be described in Section 6.2.3.

In general, the majority of the freshwater wetland will be excavated to a depth of 8-10 feet with a gently sloping bottom with a general 1- to 2-percent slope toward the culvert, which will be the lowest point in the freshwater wetland, allowing for it to drain. The culvert should have a raised inlet, allowing water to pool in the freshwater wetland, but also giving some control of the water level in the wetland, should the need arise. Ideally, between 6 and 18 inches of freshwater should pool within the wetland during storm events and for a moderate duration during the wet season to facilitate the development of freshwater habitat.

All freshwater wetland design details are conceptual at this time. A thorough elevational survey of the mitigation area is needed to develop a final design and will inform freshwater wetland depth and shape and final acreage in addition to the slope and size of the surrounding coastal wetland. The above narrative is provided as a baseline and is intended to inform future wetland design activity. Final project site design and a final assessment of impacts is needed before an engineered wetland design can be completed.

Vegetation Establishment

Native hydrophytes will be planted within the freshwater wetland to facilitate the development of high-quality wetland habitat and reduce the potential for invasive species establishment. Freshwater wetland planting will focus on the establishment of diverse Palustrine Emergent, Palustrine Scrub-shrub, and Palustrine Forested wetland habitat. As shown in Table 3, a total of 0.2-acre of Palustrine Emergent wetland habitat, 0.62-acre of Palustrine Scrub-shrub wetland habitat, and 0.32-acre of Palustrine Forested habitat is recommended to mitigate for permanent impacts to these wetlands as a result of the project. The revegetation of the freshwater creation area will focus on creating a suitable percentage of each wetland type within the freshwater creation area. The one divergence from this will be a slightly higher percentage of freshwater emergent wetland and slightly less Palustrine Scrub-shrub wetland creation. It is anticipated that Palustrine Scrub-shrub wetland habitat will expand over time reducing the extent of Palustrine Emergent habitat.

While the number of individuals and specific location of planting is not described in this conceptual design, a list of suitable native hydrophytic species to be planted in the freshwater wetland creation area is shown in Table 5. These species are appropriate for this location and have been observed in intact freshwater wetland habitat adjacent to saltmarsh habitat occurring in the vicinity of the mitigation area.

Compensatory Mitigation for Sensitive Natural Community impacts

The active planting and establishment of freshwater wetlands is intended to count toward the mitigation of impacts to wetland-dependent sensitive natural communities occurring as a result of the Proposed Project. The Proposed Project will result in permanent impacts to 2.608 acres of coast dune-Sitka willow

thickets, 0.549 acres of shining willow groves, 0.018 acres of soft and western rush-sedge marsh, and 0.014 acres of slough sedge-water parsley-small fruited bulrush (Pacific silverweed) marsh as detailed in Table 2. An estimated 1.212 acres of freshwater wetland will be actively planted as part of this restoration project. Of this, 0.40 acres will be Palustrine Emergent wetland. This habitat will be planted with 0.05 acre of pacific silverweed as a 4:1 replacement of impacted silverweed marsh. The additional area will be planted with a diverse pallet of native hydrophytes (Table 5), which will provide higher quality habitat and substantial ecological functional lift over the wetland impacted by the project. Palustrine Scrub-shrub wetlands will be established in 0.4 acres of the created freshwater wetland area. This area will be dominated by willow species and wax myrtle, with a diverse herbaceous understory (Table 5) to minimize the potential for invasive species establishment. This area is intended to mitigate for some of the impacts to coast dune willow-Sitka willow thickets by creating higher quality examples of this sensitive natural community.

Palustrine Forested wetlands will be established in 0.41 acres of the created freshwater wetland area. This area will be dominated by riparian and wetland-dependent tree species, with a diverse woody and herbaceous understory as shown in Table 5, to minimize the potential for invasive species establishment. This area is intended to mitigate for some of the impacts to shining willow groves by creating higher quality examples of this sensitive natural community that are more like forested wetlands seen in unimpacted areas along the Samoa Peninsula. See Table 8 for a breakdown in sensitive natural community mitigation credits for the entire mitigation area addressed in this conceptual plan.

Table 5. Suggested botanical species for planting within created freshwater wetlands

Scientific Name	Common Name	Wetland Indicator[a]
Palustrine Emergent Wetland		
Calamagrostis nutkaensis	Pacific reedgrass	FACW
Camassia quamash	camas	FACW
Carex cusickii	Cusick's sedge	OBL
Carex echinata ssp. *phyllomanica*	star sedge	OBL
Carex obnupta	slough sedge	OBL
Cyperus eragrostis	tall flat sedge	FACW
Eleocharis macrostachya	spike rush	NL (OBL)
Equisetum hyemale ssp. *affine*	giant scouring rush	FACW
Equisetum telmateia ssp. *braunii*	giant horsetail	FACW
Helenium bigelovii	Bigelow's sneezeweed	FACW
Juncus effusus ssp. *pacificus*	common rush	FACW
Juncus ensifolius	sword-leaved rush	FACW
Juncus patens	spreading rush	FACW
Potentilla anserina ssp. *pacifica*	Pacific silverweed	OBL
Scirpus microcarpus	small-fruited bulrush	OBL
Sisyrinchium californicum	yellow-eyed grass	FACW
Stachys chamissonis	hedgenettle	FACW
Symphyotrichum chilense	Pacific aster	FAC
Urtica dioica ssp. gracilis	nettle	FAC
Palustrine Scrub-shrub Wetland		
Carex obnupta	slough sedge	OBL
Cornus sericea ssp. *sericea*	red osier dogwood	NL (FACW)
Equisetum telmateia ssp. *braunii*	giant horsetail	FACW

Scientific Name	Common Name	Wetland Indicator[a]
Lonicera involucrata var. *ledebourii*	coast twinberry	FAC
Malus fusca	Oregon crabapple	FACW
Morella californica	California wax myrtle	FACW
Petasites frigidus var. *palmatus*	western colt's foot	FACW
Rhododendron occidentale var. *occidentale*	western azalea	FAC
Ribes bracteosum	stink currant	FAC
Rubus spectabilis	salmon berry	FAC
Salix hookeriana	coast dune willow	FACW
Salix lasiandra var. *lasiandra*	shining willow	FACW
Salix scouleriana	Scouler's willow	FAC
Salix sitchensis	Sitka willow	FACW
Spiraea douglasii	Douglas spirea	FACW
Struthiopteris spicant	deer fern	FAC
Tellima grandiflora	fringe cups	FACU
Urtica dioica ssp. *gracilis*	nettle	FAC
Palustrine Forested Wetland		
Alnus rubra	red alder	FAC
Carex obnupta	slough sedge	OBL
Equisetum telmateia ssp. *braunii*	giant horsetail	FACW
Petasites frigidus var. *palmatus*	western colt's foot	FACW
Picea sitchensis	Sitka spruce	FAC
Populus trichocarpa	black cottonwood	FAC
Rhododendron occidentale var. *occidentale*	western azalea	FAC
Ribes bracteosum	stink currant	FAC
Rubus spectabilis	salmon berry	FAC
Salix lasiandra var. *lasiandra*	shining willow	FACW
Struthiopteris spicant	deer fern	FAC
Tellima grandiflora	fringe cups	FACU
Thuja plicata	western red cedar	FAC
Tolmiea diplomenziesii	pig-a-back plant	FACW
Urtica dioica ssp. *gracilis*	nettle	FAC
Woodwardia fimbriata	chainfern	FACW

[a] Plant wetland indicator statuses from The National Wetland Plant List: 2020 Update of Wetland Ratings (USACE, 2020) are abbreviated as follows:

FACW = Facultative wetland plants. Usually occur in wetlands but may occur in non-wetlands.
FAC = Facultative plants. Occur in wetlands and non-wetlands.
FACU = Facultative upland plants. Usually occur in non-wetlands but may occur in wetlands.
NL = Not listed.
OBL = Obligate wetland plants. Almost always occur in wetlands.
UPL = Obligate upland plants. Almost never occur in wetlands.

6.2.3 Coastal Wetland Creation Area

Coastal wetland creation is proposed to mitigate for impacts to coastal aquatic features occurring as a result of the Project (Figure 3). A total of 1.103 acres of coastal wetland creation is proposed. The coastal wetlands will occur along the perimeter of both the created Estuarine and freshwater wetlands and will represent the transition from three-parameter conditions to upland. A diverse mix of native hydrophytic species will have greater ecological function than the coastal aquatic features being impacted by the project. The creation of coastal wetland attempts to address the historic loss of wetland edge habitat that is frequently dominated by native hydrophytes but may lack the pronounced wetland hydrology or hydric soils of adjacent wetlands.

The proposed wetland mitigation site is well suited for the development of coastal wetlands. Elevation of the site needs to be excavated for the development of proper hydrology for Estuarine wetlands and freshwater wetlands as described in Sections 6.2.1 and 6.2.2 leaving a transitional slope between the wetland and surrounding upland. While this area will rarely have wetland hydrology, the pronounced hydrology of the adjacent wetland areas should support deeper rooted hydrophytes proposed for this area. This will closely mirror unimpacted wetland fringes occurring within the Humboldt Bay area where woody hydrophytes ring wetland areas and are supported by the adjacent wetland hydrology.

The coastal wetland creation area is located in two distinct areas, with one surrounding the proposed freshwater wetland for a total of 0.288 acres and the other surrounding the proposed Estuarine wetland for a total of 0.815 acres (Figure 3). The proposed coastal wetlands will have a 3:1 or 4:1 slope allowing for a gentle transition away from three-parameter wetland conditions. Coastal wetland slopes will likely range between an 8.5-foot elevation at the low point to a maximum elevation of 15 feet, although it will likely be less than this in much of the mitigation area where current ground level is approximately a 12-foot elevation. In general species composition will trend from strongly hydrophytic species near the base of the slope to Facultative species near the top of the slope. Upland species will be planted at the top of the slope, and these areas will not be considered coastal wetlands.

All coastal wetland design details are conceptual at this time. A thorough elevational survey of the mitigation area is needed to develop a final design and will inform the design of the freshwater and Estuarine wetlands, which will impact the slope and size of the surrounding coastal wetland. The above narrative is provided as a baseline and is intended to inform future wetland design activity. Final project site design and a final assessment of impacts is needed before an engineered wetland design can be completed.

Vegetation Establishment

Native hydrophytes will be planted within the coastal wetland to facilitate the development of high-quality wetland edge habitat and reduce the potential for invasive species establishment. Wetland edge habitat is highly susceptible to invasive species encroachment, specifically by Himalayan blackberry and it is anticipated that invasive species will be one of the hardest challenges in the establishment of coastal wetlands. Coastal wetland creation will focus on the establishment of woody hydrophytes with a dense understory to minimize invasive species cover.

While the number of individuals and specific location of planting is not described in this conceptual design, a list of suitable native hydrophytic species to be planted in the coastal wetland creation area is shown in Table 6. These species are appropriate for this location and have been observed in intact

wetland edge habitat adjacent to freshwater wetlands saltmarsh habitat occurring in the vicinity of the mitigation area. Additionally, the proposed species list includes many culturally-significant species important for the furtherance of indigenous cultural practices in the area.

Compensatory Mitigation for Sensitive Natural Community impacts

The active planting and establishment of coastal wetlands through the planting of native hydrophytes is not intended to count toward the mitigation of impacts to wetland-dependent sensitive natural communities occurring as a result of the Proposed Project. The primary purpose of this effort is to develop coastal wetlands on the fringe of the created freshwater wetland and Estuarine wetland. This effort is inherently vegetation and habitat-dependent, and is therefore focused on a species composition that can meet hydrophytic vegetation-dominance while minimizing the establishment of invasive species, rather than a specific sensitive natural community metric.

Table 6. Suggested botanical species for planting within created coastal wetlands

Scientific Name	Common Name	Wetland Indicator[a]
Herbaceous		
Artemisia douglasiana	California mugwort	FACW
Athyrium filix-femina var. *cyclosorum*	lady fern	FAC
Calamagrostis nutkaensis	Pacific reedgrass	FACW
Carex obnupta	slough sedge	OBL
Chamerion angustifolium ssp. *circumvagum*	fireweed	FACU
Dicentra formosa	bleeding heart	FACU
Epipactis gigantea	stream orchid	OBL
Iris douglasiana	Douglas iris	NL
Maianthemum dilatatum	Pacific may lily	FAC
Mentha canadensis	wild mint	NL (FAC)
Polystichum munitum	sword fern	FACU
Urtica dioica ssp. *gracilis*	nettle	FAC
Xerophyllum tenax	common beargrass	FACU
Shrub		
Ceanothus thyrsiflorus var. *thyrsiflorus*	blue blossom	NL
Corylus cornuta ssp. *californica*	California hazelnut	FACU
Garrya elliptica	coast silk tassel	NL
Holodiscus discolor	ocean spray	FACU
Physocarpus capitatus	ninebark	FACW
Rhododendron occidentale var. *occidentale*	western azalea	FAC
Ribes sanguineum var. *sanguineum*	red flowering currant	FACU
Rosa nutkana ssp. *nutkana*	nootka rose	FAC
Rubus parviflorus	thimbleberry	FACU
Rubus spectabilis	salmonberry	FAC
Spiraea douglasii	Douglas spiraea	FACW
Trees		
Alnus rubra	red alder	FAC
Malus fusca	Oregon crabapple	FACW
Picea sitchensis	Sitka spruce	FAC
Salix hookeriana	coast dune willow	FACW
Salix lasiandra var. *lasiandra*	shining willow	FACW

Scientific Name	Common Name	Wetland Indicator[a]
Salix scouleriana	Scouler's willow	FAC
Salix sitchensis	Sitka willow	FACW
Thuja plicata	western red cedar	FAC

[a] Plant wetland indicator statuses from The National Wetland Plant List: 2020 Update of Wetland Ratings (USACE, 2020) are abbreviated as follows:

FACW = Facultative wetland plants. Usually occur in wetlands but may occur in non-wetlands.
FAC = Facultative plants. Occur in wetlands and non-wetlands.
FACU = Facultative upland plants. Usually occur in non-wetlands but may occur in wetlands.
NL = Not listed.
OBL = Obligate wetland plants. Almost always occur in wetlands.
UPL = Obligate upland plants. Almost never occur in wetlands.

6.2.4 Sensitive Natural Community Planting and Establishment

Sensitive natural community planting and establishment is proposed to mitigate for impacts to sensitive natural communities occurring as a result of the Project (Figure 3). A total of 2.664 acres are available within the mitigation area for the establishment of sensitive natural communities which is only a portion of the area needed to mitigate for the total impacts to sensitive natural communities, resulting from the Proposed Project. Sensitive natural community establishment will occur in distinct locations across the entire mitigation area as shown in Figure 3. These locations represent 2.664 acres of ruderal or Himalayan blackberry within a mosaic of existing degraded sensitive natural communities. The establishment of high-quality habitat within these areas will create a mosaic of habitat throughout the mitigation area and will link the existing ESHA together, which is currently separated by impenetrable Himalayan blackberry thickets. Additionally, establishing intact sensitive vegetation communities within these areas will create buffers for the wetlands and will reduce the potential for invasive species encroachment.

The proposed locations for the planting of sensitive natural communities are well suited for the development of high-quality habitat. The surrounding area already supports degraded sensitive natural communities, has a range of conditions present, and is on the Samoa Peninsula, which supports a wide range of sensitive natural communities, often in a small area. When these areas are restored with suitable palettes of native vegetation, the area will closely mirror unimpacted habitat occurring within the Humboldt Bay area, where diverse assemblages of natural communities occur alongside each other in a mosaic of habitats. Final vegetation composition and cover would meet the criteria for a sensitive natural community as described within the Manual of California Vegetation (CNPS, 2024)

The proposed locations within the mitigation area for the creation of sensitive natural communities are currently dominated by dense cover of Himalayan blackberry and other invasive species. The first task in the development of sensitive vegetation communities in these areas involves the removal of invasive species. This will include a yearlong process that will begin with an early spring/late winter manual and mechanical removal of aboveground material followed by root removal and ground tilling or similar ground disturbance. The area will then be left fallow to allow for root resprouting or seedling sprouting through the spring. A follow-up treatment will need to be conducted to address the resprouts, which should involve removal of all seedlings and treatment of root resprouts using targeted herbicide application if possible. This will need to be conducted in consultation with applicable agencies. The areas should lay fallow for additional time through the fall and following winter and a supplemental treatment

targeting any additional seedlings or root resprouts will need to be pulled or treated, after which the native species can be planted. The greatest challenge to the creation of sensitive natural communities in these locations is the growth of invasive species, which will compete with the planted species and degrade the quality of the habitat being established. This will require regular thorough invasive species removal for a minimum of ten years following the initial planting of native species.

There are several locations with concrete debris, compacted gravel, or concrete slabs that will need to be removed prior to planting. Much of these areas are completely covered in Himalayan blackberry and the extent of concrete in these locations will become more obvious following removal of invasive species cover. Concrete will need to be removed where found and compacted gravel will need to be ripped to a minimum depth of 12 inches. All soils in areas where concrete was removed, or compacted soils were ripped will need to be properly amended prior to planting.

Suitable native species to be planted in the sensitive natural community establishment area varies reflecting the range of habitats to be established. A list of suitable species to be planted is included in Table 7. These species are appropriate for this location and have been observed in intact sensitive natural communities occurring in the vicinity of the mitigation area. Additionally, the proposed species list includes several culturally-significant species important for the furtherance of indigenous cultural practices in the area.

The number of individuals needed to properly revegetate these areas vary, but in general trees should be spaced at 7-10 feet on center, shrubs 4-6 feet on center, and herbaceous species anywhere from 6 inches to 3 feet on center. This spacing will require an estimated 12,000 plants, with 6,000 herbaceous species, 4,000 woody shrubs, and 2,000 trees. This will provide ample cover within the sensitive natural community creation area and should reduce the potential for invasive species encroachment and dominance.

All sensitive natural community establishment design details are conceptual at this time. The above narrative is provided as a baseline and is intended to inform future sensitive natural community creation design activity. Final project site design and a final assessment of impacts is needed before a final design can be completed.

Table 7. Suggested botanical species for planting within created Sensitive Natural Communities

Scientific Name	Common Name	Wetland Indicator[a]
Herbaceous		
Achillea millefolium	yarrow	FACU
Anaphalis margaritacea	pearly everlasting	FACU
Athyrium filix-femina var. *cyclosorum*	lady fern	FAC
Calamagrostis nutkaensis	Pacific reedgrass	FACW
Chamerion angustifolium ssp. *circumvagum*	fireweed	FACU
Goodyera oblongifolia	rattlesnake plantain	FACU
Iris douglasiana	Douglas iris	NL
Polystichum munitum	sword fern	FACU
Shrub		
Arctostaphylos columbiana	redwood manzanita	NL
Arctostaphylos uva-ursi	bear berry	FACU

Scientific Name	Common Name	Wetland Indicator[a]
Berberis nervosa	Oregon grape	NL
Ceanothus prostratus var. *prostratus*	mahala mat	NL
Ceanothus thyrsiflorus var. *thyrsiflorus*	blue blossom	NL
Corylus cornuta ssp. *californica*	California hazelnut	FACU
Garrya elliptica	coast silk tassel	NL
Gaultheria shallon	salal	FACU
Holodiscus discolor	ocean spray	FACU
Lonicera hispidula	pink honeysuckle	FACU
Morella californica	wax myrtle	FACW
Physocarpus capitatus	ninebark	FACW
Ribes sanguineum var. *sanguineum*	red flowering currant	FACU
Rosa nutkana ssp. *nutkana*	nootka rose	FAC
Rubus parviflorus	thimbleberry	FACU
Sambucus racemosa var. *racemosa*	red elderberry	FACU
Vaccinium ovatum	evergreen huckleberry	FACU
Trees		
Acer macrophyllum	big leaf maple	FACU
Alnus rubra	red alder	FAC
Picea sitchensis	Sitka spruce	FAC
Pinus contorta ssp. *contorta*	beach pine	FAC
Pseudotsuga menziesii var. *menziesii*	Douglas fir	FACU
Salix hookeriana	coast dune willow	FACW
Salix lasiandra var. *lasiandra*	shining willow	FACW
Salix scouleriana	Scouler's willow	FAC
Salix sitchensis	Sitka willow	FACW

[a] Plant wetland indicator statuses from The National Wetland Plant List: 2020 Update of Wetland Ratings (USACE, 2020) are abbreviated as follows:

FACW = Facultative wetland plants. Usually occur in wetlands but may occur in non-wetlands.
FAC = Facultative plants. Occur in wetlands and non-wetlands.
FACU = Facultative upland plants. Usually occur in non-wetlands but may occur in wetlands.
NL = Not listed.
OBL = Obligate wetland plants. Almost always occur in wetlands.
UPL = Obligate upland plants. Almost never occur in wetlands.

Compensatory Mitigation for Sensitive Natural Community Impacts

The sensitive natural community planting and establishment described above represents only a portion of the area needed to mitigate for impacts to sensitive natural communities. A breakdown of the non-wetland ESHA mitigation area addressed within this conceptual mitigation plan within the proposed mitigation area is shown in Table 8. This includes sensitive natural community establishment in the Estuarine wetland, freshwater wetland, in other locations within the mitigation area, which is addressed in this section of the report as well as existing sensitive natural community enhancement described in Section 6.2.5.

Table 8. Non-wetland ESHA mitigation credits covered in this conceptual plan

Planting Area	Acres of Sensitive Natural Community Mitigation
Estuarine wetland	1.378
Freshwater wetland	1.212
Sensitive Natural Community Establishment areas	2.664
Existing ESHA Enhancement	1.103
Total Non-Wetland ESHA Mitigation Credit	**6.357**

6.2.5 Existing Sensitive Natural Community Enhancement

Sensitive natural communities occur within the proposed mitigation area, but are degraded, limiting the habitat value ofthese sensitive natural communities for supporting plants and animals within the area. A total of 4.411acres of sensitive natural communities can be enhanced within the mitigation area (Figure 3). This includes coast dune willow-Sitka willow thickets, wax myrtle scrub, and beach pine forest and woodland. These sensitive natural communities are degraded by the presence of dense invasive species cover in the understory, limited species diversity, presence of industrial debris, unsanctioned houseless encampments, and compacted fill soils. Enhancement of these degraded sensitive natural communities is proposed to mitigate for some of the impacts to sensitive natural communities resulting from the Proposed Project. Sensitive natural community enhancement will occur in all mapped occurrences of sensitive natural communities within the proposed mitigation area as shown on Figure 2. A 1:4 mitigation ratio is proposed for existing sensitive natural community enhancement meaning the 4.411 acre of sensitive natural community enhancement will count toward 1.103 acres of mitigation needed as shown in Table 8.

The proposed locations for sensitive natural community enhancement are well suited for the development of high-quality habitat. These areas already meet the species dominance criteria for sensitive natural communities in the tree canopy, however the features are degraded as mentioned above. Because these areas already support the basic requirements for a sensitive vegetation community, they can be more readily restored through the removal of invasive species and industrial debris, and the planting of native species. When these areas are restored with suitable palettes of native vegetation, the area will closely mirror unimpacted habitat occurring within the Humboldt Bay area.

All restoration activities within existing sensitive natural communities must exercise great care in avoiding existing native species, especially overstory willows, wax myrtle, and beach pine. Restoration of existing sensitive natural communities within the mitigation area will proceed in a similar manner to the sensitive natural community creation as described in Section 6.2.4. The proposed locations within the mitigation area for the creation of sensitive natural communities are currently dominated by dense coverof Himalayan blackberry and other invasive species. The first task in the development of sensitive vegetation communities in these areas involves the removal of invasive species, while avoiding and minimizing damage to native tree and shrub species. This will include a yearlong process that will begin with an early spring/late winter manual removal of aboveground material, followed by root removal with targeted shovel or other root removal methods. The area will then be left fallow to allow for root resprouting or seedling sprouting through the spring. A follow-up treatment will need to be conducted to address the resprouts, which should involve removal of all seedlings and treatment of root resprouts using targeted herbicide application if possible. This will need to be conducted in consultation with applicable agencies. The areas should lay fallow for additional time through the fall and following winter and a supplemental treatment targeting any additional seedlings or root resprouts will need to be

pulled or treated, after which the native species can be planted. Invasive species removal and resprout treatment should be conducted concurrently with the removal and treatment efforts conducted for the sensitive natural community creation areas for a reduction in staging times and ease of movement through the restoration area. The greatest challenge to the restoration of sensitive natural communities in these locations is the growth of invasive species, which will compete with the planted species and degrade the quality of the habitat being established. This will require regular thorough invasive species removal for a minimum of ten years following the initial planting of native species.

Following removal of invasive species, industrial debris shall be removed from the mitigation area where practical. During surveys of the area, where Himalayan blackberry cover allowed, large chunks of concrete and metal were observed in the understory of several of the sensitive natural communities, specifically coast dune willow-Sitka willow thickets in the southwest central portion of the mitigation area. It is not anticipated that all of this material can be removed, however removal should include as much material as is practicable without significant damage to overstory trees.

Suitable native species to be planted in the sensitive natural community restoration areas varies reflecting the range of habitats to be established. A list of suitable species to be planted is included in Table 7 in the preceding section, but at differing densities from those described for the sensitive natural community creation areas. These species are appropriate for this location and have been observed in intact sensitive natural communities occurring in the vicinity of the mitigation area.

The number of individuals needed to properly revegetate these areas vary, but in general, tree planting will be minimal and restricted to areas with low cover by overstory willows, wax myrtle, or beach pine. Suitable trees would include in-kind replacement of existing tree species, or occasional Sitka spruce to add vertical habitat to the area. Native shrub and herbaceous species planting will occur where space allows, and it is unknown what level of shrub and herbaceous species planting will be viable at this time. It is likely that a 7-10 feet on center average spacing will be suitable for shrub species and a 4-6 foot spacing for herbaceous species. Dense shrub and herbaceous species planting will minimize the potential for invasive species re-infestation.

All sensitive natural community restoration details are conceptual at this time. The above narrative is provided as a baseline and is intended to inform future sensitive natural community restoration activity. Final project site design and a final assessment of impacts is needed before a final design can be completed.

6.2.6 Osprey Nest Structures

A total of 10 Osprey nests occur within the study area, 6 of which were actively used in 2022 and 4 were inactive in 2022 (SHN, 2024b). All of these nests occur on human-made structures and all are anticipated to be impacted by the Proposed Project. A direct replacement of these nests using the installation of artificial nest platforms is proposed to mitigate for the loss of these nests. A total of five nest structures can be accommodated within the mitigation area using similar spacing to those observed within the project area. The placement of five osprey nest structures will address half of the nest impacts associated with the project. Nest structures will be placed along the Humboldt Bay shoreline and within the vicinity of the created wetlands as shown on Figure 3. While it is not likely that all nests will be in use simultaneously, osprey return to the same nesting location year after year, and multiple structures will encourage long-term nesting in the area. There are many suitable designs for creating osprey nesting structure, two examples are included in Appendix 4.

6.3 Mitigation Area Incursion Deterrence

Most of the mitigation area will be protected from human incursion by Humboldt Bay and the position of the wetlands. Existing concrete barriers along the railroad tracks on the northwestern edge of the mitigation area are a suitable deterrent for vehicular or other motorized encroachment into the mitigation area. Fencing is encouraged along the proposed access road; however, it should be wildlife-friendly to encourage movement by wildlife into and out of the mitigation area. Unsanctioned houseless encampments could severely degrade and compromise the habitat quality of the mitigation area. If this becomes a problem following completion of the mitigation work, additional fencing, monitoring, or use of specific plant species as a barrier will need to be considered.

6.4 Schedule

The proposed mitigation program schedule is unknown at the time of the writing of this conceptual mitigation plan. Additional information is needed to make a shovel-ready mitigation plan, and site design for the project is not yet complete. Initial project initiation plans called for the completion of mitigation activities during Phase 1 of the project, which would occur prior to the majority of the project and would limit the potential for temporal loss of wetland and sensitive natural community habitat. A few work window schedules that should be adhered to during initiation of the mitigation plan are included below:

- Vegetation removal and other ground-disturbing activities associated with any construction activities will occur during late August through mid-March, when birds are not typically nesting.

- If vegetation removal or ground-disturbing activity is to occur during the nesting season (March 15 to August 15 for most birds), a qualified biologist shall conduct a pre-construction nesting bird survey. Pre-construction surveys for nesting pairs, nests, and eggs shall occur within the construction limits and within 100 feet (200 feet for raptors) of the construction limits. If active nests are encountered, species-specific measures shall be prepared by a qualified biologist in consultation with the U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) and implemented to prevent abandonment of the active nest.

- Ground-disturbing activities in areas near existing wetlands, such as wetland creation adjacent to Humboldt Bay, or connecting created wetlands to existing wetlands shall occur from July 15 through October 31, to minimize potential impacts to amphibians and to reduce sedimentation and erosion within these sensitive areas.

- CDFW will be notified at least one month before the work is to begin and shall be given the name and contact information for the party responsible for supervising and documenting implementation of the mitigation plan.

7.0 Monitoring and Reporting Program

7.1 Performance Standards

Success of the mitigation program is defined as creating self-sustaining Estuarine, freshwater, and coastal wetlands and sensitive natural communities, including restored sensitive natural communities to mitigate for impacts to wetlands, and sensitive natural communities as a result of the Humboldt Bay

Offshore Wind Heavy Lift Terminal. The success of the Estuarine, freshwater, and coastal wetland mitigation and sensitive natural community creation and restoration will be determined using the following combination of success criteria:

- A total of 1.886 acres of Estuarine of wetland habitat (defined by hydrophytic vegetation dominance or absence in channels, hydric soil development, and wetland hydrology) is created to mitigate for permanent wetland impacts,
- A total of 1.212 acres of freshwater wetland habitat (defined by hydrophytic vegetation dominance, hydric soil development, and wetland hydrology) is created to mitigate for permanent wetland impacts,
- A total of 1.103 acres of coastal wetland habitat (defined by hydrophytic vegetation dominance and adjacency to wetland habitat) is created to mitigate for permanent coastal aquatic feature impacts,
- A total of 5.254 acres of sensitive natural communities (defined by vegetation species composition and cover meeting criteria for sensitive natural communities as described within the manual of California Vegetation [CNPS, 2024]) is created to mitigate for a portion of the permanent impacts to sensitive natural communities, which will be comprised of 1.378 acres of salt marsh, 1.212 acres of freshwater wetland vegetation communities, and 2.664 acres of upland sensitive natural communities,
- A total of 4.441 acres of existing sensitive natural communities are restored to mitigate for a portion of the permanent impacts to sensitive natural communities,
- 80 percent minimum cover by herbaceous plants (including wild recruitment of native species) within the created Estuarine wetland excluding the channel areas,
- 90 percent minimum cover by herbaceous and woody species within the created freshwater wetland,
- Over 100 percent absolute vegetative cover, including all stratums within created coastal wetlands,
- Over 100 percent absolute vegetative cover, including all stratums within created sensitive natural communities,
- 85 percent survival by planted trees and shrubs (including wild recruitment of native species) within all planting areas, including wetland and upland areas,
- Total absolute percent cover of invasive species within the created wetlands, created sensitive natural communities, and restored sensitive natural communities area is reduced to less than the 25 percent of the total absolute percent cover of invasive species within all strata recorded at an undisturbed reference location, with comparable wetland and upland conditions on the Samoa Peninsula,
- Hydrophytic vegetation dominance and wetland hydrology indicators occur within greater than 85 percent of the created Estuarine and freshwater wetland area (it is assumed that hydric soils will develop in time if these wetland parameters are present),
- Hydric soils are present or are developing as determined using soil samples within the created Estuarine and freshwater areas,
- Live vegetation throughout all revegetated areas (some minor gaps are expected),

- Revegetation plants are not substantially suppressed by herbivory, competition from weeds, or encroachment by humans, and
- Supplemental irrigation, or replacement plantings have not been needed in any of the mitigation areas in the final two years of monitoring to meet the 85-percent survival threshold.

7.2 Monitoring and Reporting Program

As part of any monitoring program, both quantitative and qualitative (visual assessment) sampling would be performed by a qualified ecologist/biologist. This assessment would be used to make maintenance recommendations in annual reports, which will evaluate the success of the mitigation effort. An As Planted Report will need to be produced after planting and grading to verify species, planting locations, and number of individuals planted and to document final grading of the site. The As-Planted Report would document the restoration of existing wetlands, including the removal of invasive species and planting of native species (species planted and number of individuals). The As-Planted Report will be created immediately after the completion of mitigation activities across the site and would be used as the baseline conditions to assess percent survival and success of mitigation efforts, including the success of wetland creation, percent survival of plants and trees, and invasive species removal success. It will also aid in monitoring in the future as vegetation grows and site conditions change. Any change in the number of plants and species planted during installation will be recorded within the As-Planted Report and will be approved by the project biologist prior to planting. Vegetation monitoring shall be conducted at the mitigation site for a total of ten years of monitoring and maintenance on account of the high cover by invasive species.

7.2.1 Reference Site

Monitoring of the mitigation area will utilize a comparative reference site, which will be used to compare conditions within the mitigation area to a similar undisturbed location. A suitable reference site should be minimally disturbed and have similar habitat conditions present to those that are being created within the mitigation area. This should include brackish marsh with adjacent freshwater marsh, coastal wetlands along the perimeter, and a mosaic of upland sensitive natural communities in the immediate surroundings. Additionally, the watershed for the area should be small and the salt water and freshwater marsh area should be similar in size to the mitigation area, with a combined area of four acres of salt marsh and freshwater wetlands. A suitable reference site was identified as part of this conceptual mitigation plan as shown in Appendix 2, Photos 6 and 7. This area is similar in acreage and is a blend between freshwater wetland and salt marsh within a small watershed and bounded by coastal wetlands with a mosaic of upland sensitive natural communities in the immediate vicinity (Appendix 2, Photos 8-13). Multiple permanent plots would be established within this location in the various habitats represented and would be used to compare the trajectory and quality of the habitat created for mitigation. The location and number of monitoring plots would be recorded in any As-Planted report.

7.2.2 Quantitative Sampling

Quantitative vegetation data will be collected annually in the late spring/early summer. The annual quantitative data collection site visit would be timed to maximize wetland observation and salt marsh vegetation. Quantitative assessment methods will vary across the different mitigation habitat types; however, it would involve permanent monitoring plots within each of the created wetlands, sensitive natural community creation areas, and sensitive natural community restoration areas. Other quantitative data collection methods may be suitable, such as the transect intercept method, or plots

along a transect for ease of reproducibility of monitoring data. Quantitative data collection methods would be described in greater detail within the As-Planted Report, including number of plots, plot locations, statistical analysis, and target metrics.

7.2.3 Qualitative Visual Assessment

During each monitoring event, visual observations of habitat conditions will be noted. The qualitative visual assessment will be the primary tool by which the overall habitat development is evaluated and the need for any remedial measures is identified. Qualitative visual assessment will help assess the overall functioning of the site as a whole and will help to identify localized or low-level trends, such as new invasive species encroachment, localized changes in species abundance, and other changes that might be overlooked by simply counting survival rates or looking at specific monitoring plots.

Particular attention will be paid to the following:

- native species recruitment and habitat development in the created wetlands, created sensitive natural communities, and restored sensitive natural communities,
- evidence of viable plant reproduction in the created wetlands, created sensitive natural communities, and restored sensitive natural communities,
- expansion-sensitive natural communities within the sensitive natural community establishment areas,
- changes in hydrology within the created wetlands,
- the presence of birds and other wildlife in the mitigation areas,
- introduction and infestation of exotic species; species encroachment and spread will be recorded within all mitigation and restoration areas,
- erosion within the mitigation areas,
- evidence of continued herbivory or human encroachment into the mitigation areas, and
- damage to planted trees from herbivory, trampling, or drought stress.

7.3 Photo Documentation

In addition to the general qualitative assessment and permanent plot sampling, several permanent stations for photo documentation will be established within each of the created wetlands, and in representative sensitive natural community establishment areas, and representative sensitive natural community restoration areas. Photos will be taken prior to implementation and following installation of the Proposed Project. Photo stations will be established during the first site visit and the locations will be recorded in the As-Planted Report, to be used in each successive monitoring report. Photos will include direction of view, and a reference to the photo monitoring location, and will be included within each annual monitoring report.

7.4 Annual Reports

An As-Planted Report will be produced after grading and planting to verify which species were planted and where in all mitigation areas. In addition, the As-Planted Report will document final grading elevations and conditions within the created wetland, and invasive species removal and restoration efforts within restoration areas of existing wetlands. This Report will be created immediately after the grading, invasive species removal, and planting of the site and will be the baseline values used to assess the success of the mitigation for the success criteria listed in Section 7.1. It will also aid in monitoring in the future as vegetation grows and site conditions change. Any change in the number of plants and species planted will be recorded within the As-Planted Report and will be approved by the project biologist prior to planting.

Vegetation monitoring will need to be conducted at the mitigation sites for a total of ten years of monitoring. The first annual monitoring event will occur the year following plant installation. Annual monitoring site visits should be appropriately timed to capture peak phenology and cover and should occur within the same month for each of the ten years of monitoring. Timing of monitoring will need to occur during a suitable window for the observation of hydrologic conditions within the freshwater wetland. This may require more than one monitoring visit. Recommendations for any corrective action necessary to ensure the continued success of the mitigation plan will be included in each annual report, as well as results from the quantitative and qualitative monitoring. Photos from the established photo stations will be included within each annual monitoring report. Monitoring results will be compiled into annual reports and submitted following each yearly monitoring effort. Monitoring reports, including an evaluation of success, will be due annually by February 15 and will be submitted to all applicable permitting agencies.

8.0 Maintenance Plan

8.1 Maintenance During the Five-Year Monitoring Period

8.1.1 Adaptive Management Approach to Maintenance

Adaptive management maintenance is proposed to ensure the successful establishment and persistence of habitat within the mitigation areas.

Adaptive management is used to better achieve success within mitigation areas. It allows for the inherent changes and instability experienced in natural habitats and the ecological processes that define them. Adaptive management allows the results and observations of the monitoring visits to drive the maintenance plan and the solutions to problems that may arise. This allows the project proponent and project biologist to learn by experience within site-specific environments and apply solutions to remedy deficiencies using a controlled and scientific approach.

Adaptive management procedures will be recommended on a case-by-case basis and will be reported within the annual monitoring reports. Adaptive management actions could include:

- Adjust invasive species removal methods to reduce invasive species within the mitigation areas to decrease competition from non-native grasses and forbs. This includes adjusting the timing of removal and the methods of removal dependent on the species encountered;

- Supplemental planting in areas that have deficiencies in the planted material;

- Supplemental replacement of species (may be in-kind, or if a specific species is not successful within a particular area, a suitable replacement species can be supplemented for the original plant species);
- Supplemental watering (for plants doing poorly, or supplemental plantings); and
- Additional erosion control.

Unpredictable natural conditions could potentially alter the mitigation areas and necessitate changing the goals, objectives, strategies, and actions set forth in this plan. Unpredictable natural conditions that could impact the mitigation areas include:

- Unusual weather patterns, such as extended drought, or excessive rainfall;
- Changes in plant compositions, such as thorough invasion of a new non-native invasive plant or wildlife species to the site;
- Erosion or deposition of sediments; and
- Excessive human encroachment or disturbance of the mitigation areas.

8.1.2 Maintenance Schedule

Maintenance will be conducted as necessary to meet final performance standards and will be conducted based on the findings and recommendations contained within the annual monitoring reports. As native habitat develops within the mitigation area, the need for maintenance activities (for example, watering and weed control) should decrease.

9.0 Completion of Mitigation

The Humboldt Bay Harbor, Recreation, and Conservation District (Harbor District) will be responsible for the monitoring and maintenance of the mitigation area and will notify all applicable permitting agencies upon completion of the ten-year mitigation program through the submittal of a final monitoring report. If the project meets performance standards at the end of the ten-year monitoring period, the mitigation will be considered a success. Should the mitigation fail to meet the success criteria, problems will be evaluated and further addressed, and the maintenance and monitoring program may be extended. Monitoring extensions will be done only for areas that fail to meet final success criteria. This process will continue until all standards are met or until the agencies determine that other mitigation measures are appropriate. If the mitigation effort meets all goals prior to the end of the ten-year monitoring period, CDFW, and other applicable permitting agencies may terminate the monitoring effort at their discretion.

10.0 Responsible Parties

The following participants are responsible for the installation, maintenance, and monitoring of any future mitigation program. The responsibilities of each party are described below.

10.1 Project Proponent

The project proponent (Harbor District) will be ultimately responsible to ensure that the approved mitigation plan is implemented and successful. The Harbor District will be responsible for financing the preparation, maintenance, and monitoring of the mitigation areas.

10.2 Project Biologist

Monitoring of the mitigation area will be the responsibility of a qualified biologist. The Harbor District is responsible for retaining the project biologist. The project biologist will coordinate with Harbor District staff to assist with interpreting mitigation goals and performance standards.

After each annual monitoring event, the project biologist will provide the Harbor District with a written list of items in need of attention. The project biologist will be responsible for identifying habitat areas requiring remedial measures and for directing the implementation of such measures.

11.0 References

California Native Plant Society (CNPS). (2024). Manual of California Vegetation, Online Edition. Sacramento, CA:CNPS. Accessed February 2024 at: http://www.cnps.org/cnps/vegetation/.

California Sea Level Rise Guidance: 2024 Science and Policy Update. (2024). California Sea Level Rise Science Task Force, California Ocean Protection Council, California Ocean Science Trust.

Cowardin et al. (1979). U.S. Department of the Interior: Fish and Wildlife Service: Classifications of Wetlands and Deepwater Habitats of the United States. Reprinted 1992.

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U.S. Army Corps of Engineers (USACE). (2016). Updated Map and Drawing Standards for the South Pacific Division Regulatory Program. Accessed at: https://www.spd.usace.army.mil/Missions/Regulatory/Public-Notices-and-References/Article/651327/updated-map-and-drawing-standards/.

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Mitigation Ratio Checklists

1

Artificial

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/29/2024	Corps File No.:	SPL-2013-NNN	Project Manager:	Joseph Saler (SHN)			
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal	ORM Resource Type:	Wetland		Hydrology: Seasonal		
	Impact Cowardin or HGM type:	Artificial Aquatic Features	Impact area :	0.552	acres	Impact distance:		linear feet
		Column A		**Column B**			**Column C**	
		Mitigation Site Name:	North Site	Mitigation Site Name:	North Site	Mitigation Site Name:		
		Mitigation Type:	Salt Marsh and freshwater wetland Creation	Mitigation Type:		Mitigation Type:		
		ORM Resource Type:	Wetland	ORM Resource Type:		ORM Resource Type:		
		Cowardin/HGM type:	Palustrine, Estuarine Tidal, and unconsolidated shore	Cowardin/HGM type:		Cowardin/HGM type:		
		Hydrology:	Seasonal and tidal	Hydrology:		Hydrology:		
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	
		Ratio adjustment:	**-0.6**	Ratio adjustment:		Ratio adjustment:		
		Baseline ratio:	**1.00 : 1.60**	Baseline ratio:	**1.00 1.00**	Baseline ratio:	**1.00 : 1.00**	
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1	
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**	Ratio adjustment from BAMI procedure (attached):	**:**	Ratio adjustment from BAMI procedure (attached):	**:**	
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**	Ratio adjustment:		Ratio adjustment:		
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification impact site and mitigation location are within the same watershed		PM justification:		PM justification:		
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: The proposed mitigation area is in upland fill with no wetland habitat		PM justification:		PM justification:		
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: In kind or better. Impact sites are artificial, highly manipulated, and disturbed		PM justification:		PM justification:		
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Permittee responsible (see 12501.3 examples #1,3, and 5)		PM justification:		PM justification:		
8	**Temporal loss**:	Ratio adjustment:	**1.5**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat		PM justification:		PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.60	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	
		Total adjustments (3-8):	1.60	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00	
		Final ratio:	**1.63 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**	
		Proposed impact (total):	0.552 acres	Remaining impact:	acres	Remaining impact (acres):	acres	
			0 linear feet		#VALUE! linear feet	Remaining impact (linear feet):	#VALUE! linear feet	
		to Resource type:	0	to Resource type:	0	to Resource type:	0	
		Cowardin or HGM:	Artificial Aquatic Features	Cowardin or HGM:	Artificial Aquatic Features	Cowardin or HGM:	Artificial Aquatic Features	
		Hydrology:	0	Hydrology:	0	Hydrology:	0	
		Required Mitigation*:	0.90 acres	Required Mitigation*:	#VALUE! acres	Required Mitigation:	#VALUE! acres	
			0.0 linear feet		#VALUE! linear feet		#VALUE! linear feet	
		of Resource type:	Wetland	of Resource type:	0	of Resource type:	0	

Artificial

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Cowardin or HGM: Palustrine, Estuarine Hydrology: Seasonal and tidal Proposed Mitigation**: acres / linear feet Impact Unmitigated: % / acres Additional PM comments: Impacts to Artificial aquatic features and associated habitat impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres / linear feet Impact Unmitigated: % / acres Additional PM comments:	Cowardin or HGM: 0 Hydrology: 0 Proposed Mitigation**: acres / linear feet Impact Unmitigated: % / acres Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 0.9 acres of estuarine and palustrine wetland creation to mitigate for the loss of 0.552 acres of artificial aquatic features.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Artificial

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	large gain
Subsurface water storage	no loss	small gain
Moderation of groundwater flow or discharge	moderate loss	large gain
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	moderate loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Adjustment: -0.6

PM Justification:

The impacted wetlands are artificially induced former drainage and stormwater features and most have low quality habitat present, with reduced wetland function

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Coastal

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/29/2024	Corps File No.:	SPL-2013-NNN		Project Manager:	Joseph Saler (SHN)					
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal		ORM Resource Type:	Wetland			Hydrology: Seasonal			
	Impact Cowardin or HGM type:	Coastal Aquatic Features		Impact area :	0.7	acres	Impact distance:				linear feet
		Column A			**Column B**			**Column C**			
		Mitigation Site Name:	North Site		Mitigation Site Name:	North Site		Mitigation Site Name:			
		Mitigation Type:	Salt Marsh and freshwater wetland Creation		Mitigation Type:			Mitigation Type:			
		ORM Resource Type:	Wetland		ORM Resource Type:			ORM Resource Type:			
		Cowardin/HGM type:	Palustrine, Estuarine Tidal, and unconsolidated shore		Cowardin/HGM type:			Cowardin/HGM type:			
		Hydrology:	Seasonal and tidal		Hydrology:			Hydrology:			
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**		Starting ratio:	**1.0 : 1.0**		Starting ratio:	**1.0 : 1.0**		
		Ratio adjustment:	**-0.5**		Ratio adjustment:			Ratio adjustment:			
		Baseline ratio:	**1.00 : 1.50**		Baseline ratio:	**1.00 1.00**		Baseline ratio:	**1.00 : 1.00**		
		PM justification:	see Table		PM justification:	see Table		PM justification:	see Table 1		
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**		Ratio adjustment from BAMI procedure (attached):	**:**		Ratio adjustment from BAMI procedure (attached):	**:**		
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**		Baseline ratio:	**: 1.00**		Baseline ratio:	**: 1.00**		
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**		Ratio adjustment:			Ratio adjustment:			
4	**Mitigation site location**:	Ratio adjustment:	**0**		Ratio adjustment:			Ratio adjustment:			
		PM justification impact site and mitigation location are within the same watershed			PM justification:			PM justification:			
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**		Ratio adjustment:			Ratio adjustment:			
		PM justification: The proposed mitigation area is in upland fill with no wetland habitat			PM justification:			PM justification:			
6	**Type conversion:**	Ratio adjustment:	**0**		Ratio adjustment:			Ratio adjustment:			
		PM justification: In kind or better. Impact sites are artificial, highly manipulated, and disturbed			PM justification:			PM justification:			
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**		Ratio adjustment:			Ratio adjustment:			
		PM justification: Permittee responsible (see 12501.3 examples #1,3, and 5)			PM justification:			PM justification:			
8	**Temporal loss**:	Ratio adjustment:	**1.5**		Ratio adjustment:			Ratio adjustment:			
		PM justification: Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat			PM justification:			PM justification:			
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.50		Baseline ratio from 2.a, b or c:	0.00 : 1.00		Baseline ratio from 2.a, b or c:	0.00 : 1.00		
		Total adjustments (3-8):	1.60		Total adjustments (3-8):	0.00		Total adjustments (3-8):	0.00		
		Final ratio:	**1.73 : 1.00**		Final ratio:	**0.00 : 1.00**		Final ratio:	**0.00 : 1.00**		
		Proposed impact (total):	0.7	acres	Remaining impact:		acres	Remaining impact (acres):		acres	
			0	linear feet		#VALUE!	linear feet	Remaining impact (linear feet):	#VALUE!	linear feet	
		to Resource type:	0		to Resource type:	0		to Resource type:	0		
		Cowardin or HGM:	Coastal Aquatic Features		Cowardin or HGM:	Coastal Aquatic Features		Cowardin or HGM:	Coastal Aquatic Features		
		Hydrology:	0		Hydrology:	0		Hydrology:	0		
		Required Mitigation*:	1.21	acres	Required Mitigation*:	#VALUE!	acres	Required Mitigation:	#VALUE!	acres	
			0.0	linear feet		#VALUE!	linear feet		#VALUE!	linear feet	
		of Resource type:	Wetland		of Resource type:	0		of Resource type:	0		
		Cowardin or HGM:	Palustrine, Estuarine		Cowardin or HGM:	0		Cowardin or HGM:	0		
		Hydrology:	Seasonal and tidal		Hydrology:	0		Hydrology:	0		
		Proposed Mitigation**:		acres	Proposed Mitigation**:		acres	Proposed Mitigation**:		acres	
				linear feet			linear feet			linear feet	

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Impact Unmitigated: % acres	Impact Unmitigated: % acres	Impact Unmitigated: % acres
	Additional PM comments: Impacts to Coastal aquatic features and associated habitat impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Additional PM comments:	Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 1.21 acres of estuarine and palustrine wetland creation to mitigate for the loss of 0.700 acres of coastal aquatic features.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Coastal

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	no loss	large gain
Subsurface water storage	no loss	small gain
Moderation of groundwater flow or discharge	no loss	large gain
Dissipation of energy	no loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	moderate loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Adjustment: -0.5

PM Justification:

The impacted coastal aquatic features are artiicially induced or impacted and most have low quality habitat present with little wetland function

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Adjustment:

PM Justification:

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Estuarine

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/28/2024	Corps File No.:	SPL-2013-NNN	Project Manager:	Joseph Saler (SHN)			
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal Estuarine Emergent and Unconsolidated shore	ORM Resource Type:	Wetland		Hydrology: Brackish Tidal, seasonal,		
	Impact Cowardin or HGM type: Estuarine Wetlands		Impact area :	0.052	acres	Impact distance:		linear feet
		Column A		**Column B**		**Column C**		
		Mitigation Site Name:	North Site	Mitigation Site Name:	North Site	Mitigation Site Name:		
		Mitigation Type:	Salt Marsh Creation	Mitigation Type:		Mitigation Type:		
		ORM Resource Type:	Wetland	ORM Resource Type:		ORM Resource Type:		
		Cowardin/HGM type:	Estuarine Tidal and unconsolidated shore	Cowardin/HGM type:		Cowardin/HGM type:		
		Hydrology:	Tidal	Hydrology:		Hydrology:		
2.a	**Qualitative impact-mitigation comparison**: **Note: Step 2 qualitative comparison, attached**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	
		Ratio adjustment:	**0.0**	Ratio adjustment:		Ratio adjustment:		
		Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1	
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**	Ratio adjustment from BAMI procedure (attached):	**:**	Ratio adjustment from BAMI procedure (attached):	**:**	
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**	Ratio adjustment:		Ratio adjustment:		
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	impact site and mitigation location are within the same watershed	PM justification:		PM justification:		
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	The proposed mitigation area is in upland fill with no wetland habitat	PM justification:		PM justification:		
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	In kind or better. Impact sites are highly manipulated and disturbed	PM justification:		PM justification:		
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	Permittee responsible (see 12501.3 examples #1,3, and 5)	PM justification:		PM justification:		
8	**Temporal loss**:	Ratio adjustment:	**3**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat	PM justification:		PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	
		Total adjustments (3-8):	3.10	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00	
		Final ratio:	**4.10 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**	
		Proposed impact (total):	0.052 acres	Remaining impact:	0.00 acres	Remaining impact (acres):	acres	
			0 linear feet		0 linear feet	Remaining impact (linear feet):	#VALUE! linear feet	
		to Resource type:	0	to Resource type:	0	to Resource type:	0	
		Cowardin or HGM:	Estuarine Emergent and	Cowardin or HGM:	Estuarine Emergent and	Cowardin or HGM:	Estuarine Emergent and	
		Hydrology:	0	Hydrology:	0	Hydrology:	0	
		Required Mitigation*:	0.21 acres	Required Mitigation*:	0.00 acres	Required Mitigation:	#VALUE! acres	
			0.0 linear feet		0.0 linear feet		#VALUE! linear feet	
		of Resource type:	Wetland	of Resource type:	0	of Resource type:	0	
		Cowardin or HGM:	Estuarine Tidal and	Cowardin or HGM:	0	Cowardin or HGM:	0	
		Hydrology:	Tidal	Hydrology:	0	Hydrology:	0	
		Proposed Mitigation**:	0.21 acres	Proposed Mitigation**:	acres	Proposed Mitigation**:	acres	
			linear feet		linear feet		linear feet	

Estuarine

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Impact Unmitigated: 2 0.00 % acres	Impact Unmitigated: % acres	Impact Unmitigated: % acres
	Additional PM comments: Impacts to Estuarine wetlands impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Additional PM comments:	Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 0.21 acres of estuarine wetland creation to mitigate for the loss of 0.052 acres of estuarine wetlands.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	no loss	large gain
Subsurface water storage	no loss	no gain
Moderation of groundwater flow or discharge	small loss	large gain
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	small loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Adjustment: 0

PM Justification: See 12501.5 FAQ#8 (2013)

From QMS 12501.5 FAQ #8:
"For most functions if impact <mitigation (I<M) then use adjustment <zero and ≥-2. If impact = mitigation (I=M), then use adjustment = 0. If I>M, use adjustment >0 and ≤4.

Adjustment:

PM Justification:

Adjustment:

PM Justification:

Palustrine Emergent

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/29/2024	Corps File No.:	SPL-2013-NNN	Project Manager:	Joseph Saler (SHN)			
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal	ORM Resource Type:	Wetland		Hydrology: Seasonal		
	Impact Cowardin or HGM type:	Palustrine Emergent	Impact area :	0.066	acres	Impact distance:		linear feet
	Estuarine Wetlands	**Column A**		**Column B**		**Column C**		
		Mitigation Site Name:	North Site	Mitigation Site Name:	North Site	Mitigation Site Name:		
		Mitigation Type:	Salt Marsh and Freshwater Creation	Mitigation Type:		Mitigation Type:		
		ORM Resource Type:	Wetland	ORM Resource Type:		ORM Resource Type:		
		Cowardin/HGM type:	Palustrine Emergent, Estuarine Tidal, and unconsolidated shore	Cowardin/HGM type:		Cowardin/HGM type:		
		Hydrology:	Seasonal and Tidal	Hydrology:		Hydrology:		
2.a	**Qualitative impact-mitigation comparison**: **Note: Step 2 qualitative comparison, attached**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	
		Ratio adjustment:	**-0.2**	Ratio adjustment:		Ratio adjustment:		
		Baseline ratio:	**0.80 : 1.20**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1	
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**	Ratio adjustment from BAMI procedure (attached):	:	Ratio adjustment from BAMI procedure (attached):	:	
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**	Ratio adjustment:		Ratio adjustment:		
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	impact site and mitigation location are within the same watershed	PM justification:		PM justification:		
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	The proposed mitigation area is in upland fill with no wetland habitat	PM justification:		PM justification:		
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	In kind or better. Impact sites are highly manipulated and disturbed	PM justification:		PM justification:		
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	Permittee responsible (see 12501.3 examples #1,3, and 5)	PM justification:		PM justification:		
8	**Temporal loss**:	Ratio adjustment:	**1.5**	Ratio adjustment:		Ratio adjustment:		
		PM justification:	Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat	PM justification:		PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	0.80 : 1.20	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	
		Total adjustments (3-8):	1.60	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00	
		Final ratio:	**2.00 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**	
		Proposed impact (total):	0.066 acres	Remaining impact:	acres	Remaining impact (acres):	acres	
			0 linear feet		#VALUE! linear feet	Remaining impact (linear feet):	#VALUE! linear feet	
		to Resource type:	0	to Resource type:	0	to Resource type:	0	
		Cowardin or HGM:	Palustrine Emergent	Cowardin or HGM:	Palustrine Emergent	Cowardin or HGM:	Palustrine Emergent	
		Hydrology:	0	Hydrology:	0	Hydrology:	0	
		Required Mitigation*:	0.13 acres	Required Mitigation*:	#VALUE! acres	Required Mitigation:	#VALUE! acres	
			0.0 linear feet		#VALUE! linear feet		#VALUE! linear feet	
		of Resource type:	Wetland	of Resource type:	0	of Resource type:	0	
		Cowardin or HGM:	Palustrine Emergent,	Cowardin or HGM:	0	Cowardin or HGM:	0	
		Hydrology:	Seasonal and Tidal	Hydrology:	0	Hydrology:	0	
		Proposed Mitigation**:	acres	Proposed Mitigation**:	acres	Proposed Mitigation**:	acres	

	Impact Unmitigated: [redacted] linear feet / % / acres	Impact Unmitigated: [redacted] linear feet / % / acres	Impact Unmitigated: [redacted] linear feet / % / acres
	Additional PM comments: Impacts to Palustrine Emergent wetlands impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Additional PM comments:	Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 0.13 acres of estuarine and palustrine wetland creation to mitigate for the loss of 0.066 acres of Palustrine Emergent wetlands.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.
**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	large gain
Subsurface water storage	no loss	no gain
Moderation of groundwater flow or discharge	small loss	large gain
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	small loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Instructions:

1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Adjustment: -0.2

PM Justification: See 12501.5 FAQ#8 (2013)

From QMS 12501.5 FAQ #8:
"For most functions if impact <mitigation (I<M) then use adjustment <zero and ≥-2. If impact = mitigation (I=M), then use adjustment = 0. If I>M, use adjustment >0 and ≤4.

Adjustment:

PM Justification:

Adjustment:

PM Justification:

Palustrine Forested

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/29/2024	Corps File No.:	SPL-2013-NNN	Project Manager:	Joseph Saler (SHN)			
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal	ORM Resource Type:	Wetland		Hydrology: Seasonal		
	Impact Cowardin or HGM type:	Palustrine Forested	Impact area :	0.082	acres	Impact distance:		linear feet
		Column A		**Column B**		**Column C**		
		Mitigation Site Name:	North Site	Mitigation Site Name:	North Site	Mitigation Site Name:		
		Mitigation Type:	Salt Marsh and freshwater wetland Creation	Mitigation Type:		Mitigation Type:		
		ORM Resource Type:	Wetland	ORM Resource Type:		ORM Resource Type:		
		Cowardin/HGM type:	Palustrine Forested, Estuarine Tidal, and unconsolidated shore	Cowardin/HGM type:		Cowardin/HGM type:		
		Hydrology:	Seasonal and tidal	Hydrology:		Hydrology:		
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	
		Ratio adjustment:	**-0.1**	Ratio adjustment:		Ratio adjustment:		
		Baseline ratio:	**1.00 : 1.10**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1	
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**	Ratio adjustment from BAMI procedure (attached):	**:**	Ratio adjustment from BAMI procedure (attached):	**:**	
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**	Ratio adjustment:		Ratio adjustment:		
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification impact site and mitigation location are within the same watershed		PM justification:		PM justification:		
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: The proposed mitigation area is in upland fill with no wetland habitat		PM justification:		PM justification:		
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: In kind or better. Impact sites are highly manipulated and disturbed		PM justification:		PM justification:		
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Permittee responsible (see 12501.3 examples #1,3, and 5)		PM justification:		PM justification:		
8	**Temporal loss**:	Ratio adjustment:	**1.5**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat		PM justification:		PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.10	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	
		Total adjustments (3-8):	1.60	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00	
		Final ratio:	**2.36 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**	
		Proposed impact (total):	0.082 acres	Remaining impact:	acres	Remaining impact (acres):	acres	
			0 linear feet		#VALUE! linear feet	Remaining impact (linear feet):	#VALUE! linear feet	
		to Resource type:	0	to Resource type:	0	to Resource type:	0	
		Cowardin or HGM:	Palustrine Forested	Cowardin or HGM:	Palustrine Forested	Cowardin or HGM:	Palustrine Forested	
		Hydrology:	0	Hydrology:	0	Hydrology:	0	
		Required Mitigation*:	0.19 acres	Required Mitigation*:	#VALUE! acres	Required Mitigation:	#VALUE! acres	
			0.0 linear feet		#VALUE! linear feet		#VALUE! linear feet	
		of Resource type:	Wetland	of Resource type:	0	of Resource type:	0	
		Cowardin or HGM:	Palustrine Forested,	Cowardin or HGM:	0	Cowardin or HGM:	0	
		Hydrology:	Seasonal and tidal	Hydrology:	0	Hydrology:	0	

Palustrine Forested

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments: Impacts to Palustrine Scrub-shrub wetlands impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments:	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 0.19 acres of estuarine and palustrine wetland creation to mitigate for the loss of 0.082 acres of palustrine forested wetlands.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	large gain
Subsurface water storage	no loss	small gain
Moderation of groundwater flow or discharge	small loss	large gain
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	moderate loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Adjustment: -0.1

PM Justification: The impacted wetlands are severely degraded and most have low quality habitat present, with reduced wetland function

Adjustment:

PM Justification:

Adjustment:

PM Justification:

Palustrine Scrub-shrub

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

1	Date: 2/29/2024	Corps File No.:	SPL-2013-NNN	Project Manager:	Joseph Saler (SHN)			
	Impact Site Name:	Humboldt Bay Offshore Wind Heavy Lift Terminal	ORM Resource Type:	Wetland		Hydrology: Seasonal		
	Impact Cowardin or HGM type:	Palustrine Scrub-Shrub	Impact area :	0.203	acres	Impact distance:		linear feet
		Column A		**Column B**		**Column C**		
		Mitigation Site Name:	North Site	Mitigation Site Name:	North Site	Mitigation Site Name:		
		Mitigation Type:	Salt Marsh and freshwater wetland Creation	Mitigation Type:		Mitigation Type:		
		ORM Resource Type:	Wetland	ORM Resource Type:		ORM Resource Type:		
		Cowardin/HGM type:	Palustrine Scrub-shrub, Estuarine Tidal, and unconsolidated shore	Cowardin/HGM type:		Cowardin/HGM type:		
		Hydrology:	Seasonal and tidal	Hydrology:		Hydrology:		
2.a	**Qualitative impact-mitigation comparison**:	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	Starting ratio:	**1.0 : 1.0**	
		Ratio adjustment:	**-0.1**	Ratio adjustment:		Ratio adjustment:		
		Baseline ratio:	**1.00 : 1.10**	Baseline ratio:	**1.00 : 1.00**	Baseline ratio:	**1.00 : 1.00**	
		PM justification:	see Table	PM justification:	see Table	PM justification:	see Table 1	
2.b	**Quantitative impact-mitigation comparison**:	Ratio adjustment from BAMI procedure (attached):	**N/A : N/A**	Ratio adjustment from BAMI procedure (attached):	**:**	Ratio adjustment from BAMI procedure (attached):	**:**	
2.c	**Preservation (Table 2, step A)**	Baseline ratio:	**N/A : 1.00**	Baseline ratio:	**: 1.00**	Baseline ratio:	**: 1.00**	
3	**Preservation (Table 2, step E)**	Ratio adjustment:	**N/A**	Ratio adjustment:		Ratio adjustment:		
4	**Mitigation site location**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification impact site and mitigation location are within the same watershed		PM justification:		PM justification:		
5	**Net loss of aquatic resource surface area**:	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: The proposed mitigation area is in upland fill with no wetland habitat		PM justification:		PM justification:		
6	**Type conversion:**	Ratio adjustment:	**0**	Ratio adjustment:		Ratio adjustment:		
		PM justification: In kind or better. Impact sites are highly manipulated and disturbed		PM justification:		PM justification:		
7	**Risk and uncertainty**:	Ratio adjustment:	**0.1**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Permittee responsible (see 12501.3 examples #1,3, and 5)		PM justification:		PM justification:		
8	**Temporal loss**:	Ratio adjustment:	**1.5**	Ratio adjustment:		Ratio adjustment:		
		PM justification: Temporary impacts during construction would be approximately 3 to 6 months to establish functional wetland habitat		PM justification:		PM justification:		
9	**Final mitigation ratio(s):**	Baseline ratio from 2.a, b or c:	1.00 : 1.10	Baseline ratio from 2.a, b or c:	0.00 : 1.00	Baseline ratio from 2.a, b or c:	0.00 : 1.00	
		Total adjustments (3-8):	1.60	Total adjustments (3-8):	0.00	Total adjustments (3-8):	0.00	
		Final ratio:	**2.36 : 1.00**	Final ratio:	**0.00 : 1.00**	Final ratio:	**0.00 : 1.00**	
		Proposed impact (total):	0.203 acres	Remaining impact:	acres	Remaining impact (acres):	acres	
			0 linear feet		#VALUE! linear feet	Remaining impact (linear feet):	#VALUE! linear feet	
		to Resource type:	0	to Resource type:	0	to Resource type:	0	
		Cowardin or HGM:	Palustrine Scrub-Shrub	Cowardin or HGM:	Palustrine Scrub-Shrub	Cowardin or HGM:	Palustrine Scrub-Shrub	
		Hydrology:	0	Hydrology:	0	Hydrology:	0	
		Required Mitigation*:	0.48 acres	Required Mitigation*:	#VALUE! acres	Required Mitigation:	#VALUE! acres	
			0.0 linear feet		#VALUE! linear feet		#VALUE! linear feet	
		of Resource type:	Wetland	of Resource type:	0	of Resource type:	0	
		Cowardin or HGM:	Palustrine Scrub-shrub,	Cowardin or HGM:	0	Cowardin or HGM:	0	
		Hydrology:	Seasonal and tidal	Hydrology:	0	Hydrology:	0	

Palustrine Scrub-shrub

Attachment 12501.6 - SPD Mitigation Ratio Setting Checklist (See 12501-SPD for Revisions Sheet)

	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments: Impacts to Palustrine Scrub-shrub wetlands impacted by the project can be fully mitigated within the proposed wetland mitigation site.	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments:	Proposed Mitigation**: [redacted] acres / linear feet Impact Unmitigated: % / acres Additional PM comments:
10 **Final compensatory mitigation requirements:**	Final requirement is for 0.48 acres of estuarine and palustrine wetland creation to mitigate for the loss of 0.203 acres of palustrine scrub-shrub wetlands.		

*At PM's discretion, if applicant's proposed mitigation is less than checklist requirement and additional mitigation type(s) proposed, complete additional columns as needed.

**Only enter proposed mitigation into spreadsheet if accepting applicant's lower (than required ratio) proposal.

Table 1: Qualitative comparison of functions (functional loss vs. gain) (instructions at bottom).

Functions (Column A)	Impact site	Mitigation site
Short- or long-term surface water storage	small loss	large gain
Subsurface water storage	no loss	small gain
Moderation of groundwater flow or discharge	small loss	large gain
Dissipation of energy	small loss	large gain
Cycling of nutrients	small loss	large gain
Removal of elements and compounds	small loss	large gain
Retention of particulates	moderate loss	large gain
Export of organic carbon	small loss	large gain
Maintenance of plant and animal communities	small loss	large gain

Function (Column B)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Function (Column C)	Impact site	Mitigation site
Short- or long-term surface water storage		
Subsurface water storage		
Moderation of groundwater flow or discharge		
Dissipation of energy		
Cycling of nutrients		
Removal of elements and compounds		
Retention of particulates		
Export of organic carbon		
Maintenance of plant and animal communities		

Instructions:
1. Describe amount of functional loss (impact) and gain (mitigation) in each respective column. Gain and loss can be described in text (for example, small loss, moderate loss, large loss, no loss, etc.) or symbolically (for example, +, ++, +++, 0, ---, --, -).
2. Note: alternate lists of functions may be used.
3. Note: a single adjustment should be used to account for all functions combined (see example 7 in attachment 12501.3)

Adjustment: -0.1

PM Justification: The impacted wetlands are severely degraded and most have low quality habitat present, with reduced wetland function

Adjustment:

PM Justification:

Adjustment:

PM Justification:

Photos 2

Photo 1: Proposed mitigation area in the late 1940s. Note use of the area as a railyard and tidelands for log storage. Additional bay fill occurred after this point.

Photo 2: Proposed mitigation area in 1983. Conditions are similar to what they are today, but with less vegetative cover and use of the area as a gravel lot, which is reflected in the soil conditions found onsite.

Photo 3: Proposed mitigation area looking south across the proposed Estuarine wetland creation area. Note upland conditions and non-native grasses dominant. Note willow cover beyond, mapped as sensitive natural communities as shown on Figure 4.

Photo 4: Proposed mitigation area looking west across the proposed Estuarine wetland creation area. Note upland conditions and non-native species-dominant. Note willow cover beyond, mapped as a sensitive natural community as shown on Figure 4.

Photo 5: Proposed mitigation area looking north from within the proposed Estuarine wetland creation area. Note upland conditions and non-native species-dominant. Note beach pine beyond, mapped as a sensitive natural community as shown on Figure 4.

Photo 6: Suitable reference location with a similar watershed size and wetland area to the proposed mitigation area.

Photo 7: Suitable reference location on the Samoa peninsula along the Mad River slough.

Photo 8: Suitable reference conditions for Palustrine Scrub-shrub wetlands. This is what created Palustrine Scrub-shrub wetlands should ultimately look like.

Photo 9: Suitable reference conditions for Estuarine wetlands, freshwater wetlands, and coastal wetlands. Note transition from brackish Estuarine to freshwater wetlands surrounded by wooded coastal wetlands. This is what the mitigation area should ultimately look like.

Photo 10: Suitable reference conditions for Estuarine wetlands, freshwater wetlands, and coastal wetlands. Note transition from brackish Estuarine to freshwater wetlands surrounded by wooded coastal wetlands. This is what the mitigation area should ultimately look like.

Photo 11: Suitable reference conditions for Estuarine wetlands, freshwater wetlands, and coastal wetlands. Note transition from brackish Estuarine to freshwater wetlands surrounded by wooded coastal wetlands. This is what the mitigation area should ultimately look like.

Photo 12: Suitable reference conditions for Estuarine wetland and channels.

Photo 13: Suitable reference conditions for Estuarine wetland and channel connectivity to Mad River Slough along Humboldt Bay.

Predicted Sea Level Rise Chart

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Table 2. Sea Level Scenarios for N. Spit, Humboldt Bay.

Median values of Sea Level Scenarios, in feet, for each decade from 2020 to 2150, with a baseline of 2000. All median scenario values incorporate the local estimate of vertical land motion.

Year	Low	Int-Low	Intermediate	Int-High	High
2020	0.3	0.4	0.4	0.4	0.4
2030	0.5	0.6	0.6	0.6	0.7
2040	0.7	0.8	0.9	1	1.1
2050	0.9	1	1.2	1.4	1.6
2060	1.1	1.3	1.5	2	2.4
2070	1.3	1.5	1.9	2.7	3.5
2080	1.4	1.8	2.5	3.6	4.7
2090	1.6	2.1	3.1	4.5	6
2100	1.8	2.4	3.9	5.5	7.3
2110	1.9	2.7	4.6	6.5	8.7
2120	2.1	3	5.3	7.3	9.9
2130	2.3	3.3	5.9	8	10.8
2140	2.4	3.5	6.5	8.6	11.9
2150	2.6	3.8	7.1	9.3	12.8

Osprey Nest Structures

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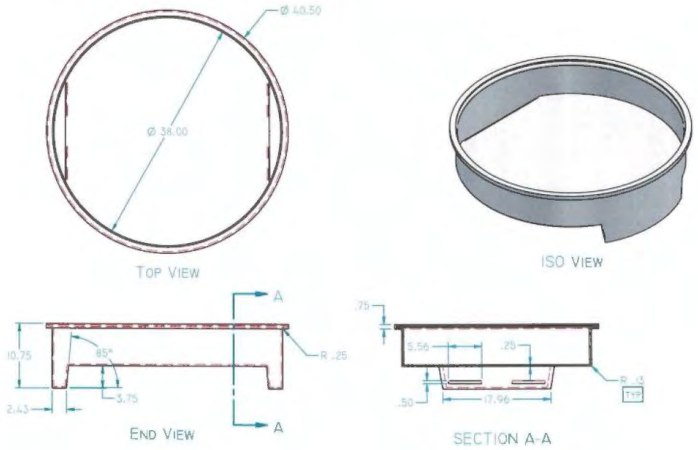
Zena - Bird Nest

" The Hollonest"

The Zena Bird Nest - encourages the birds to use the nest rather than building their own on the power line structures. Moving the birds away from the unsafe, and sensitive areas, effectively lowers the risks of avian electrocution, insulator and streamer flashovers, structure corrosion and bird strikes.

The nest is cross ribbed for extra strength and also has drainage points on two sides



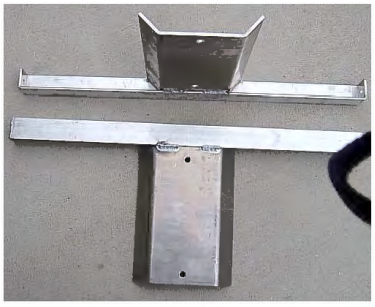
Features

Designed specifically for osprey and larger birds, the Zena Hollonest: *(Available in Gray or Black)*

- Is bird safe and environmentally friendly,
- Installs quickly, reducing downtime,
- Has excellent self-washing characteristics
- Is stackable – for storage & transportation

Application

The Zena Hollonest is shipped stacked & ready to mount on wooden & concrete poles, as well as steel structures within minutes. It is molded using proprietary high-density polyethylene that is contaminant and weather-resistant, and is fixed to the structure using (optional) **Stainless Steel brackets** or **Stainless Steel banding**.



For More Information

To learn more about how our products and services could help your organization, please contact us.

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Osprey Nest Platform

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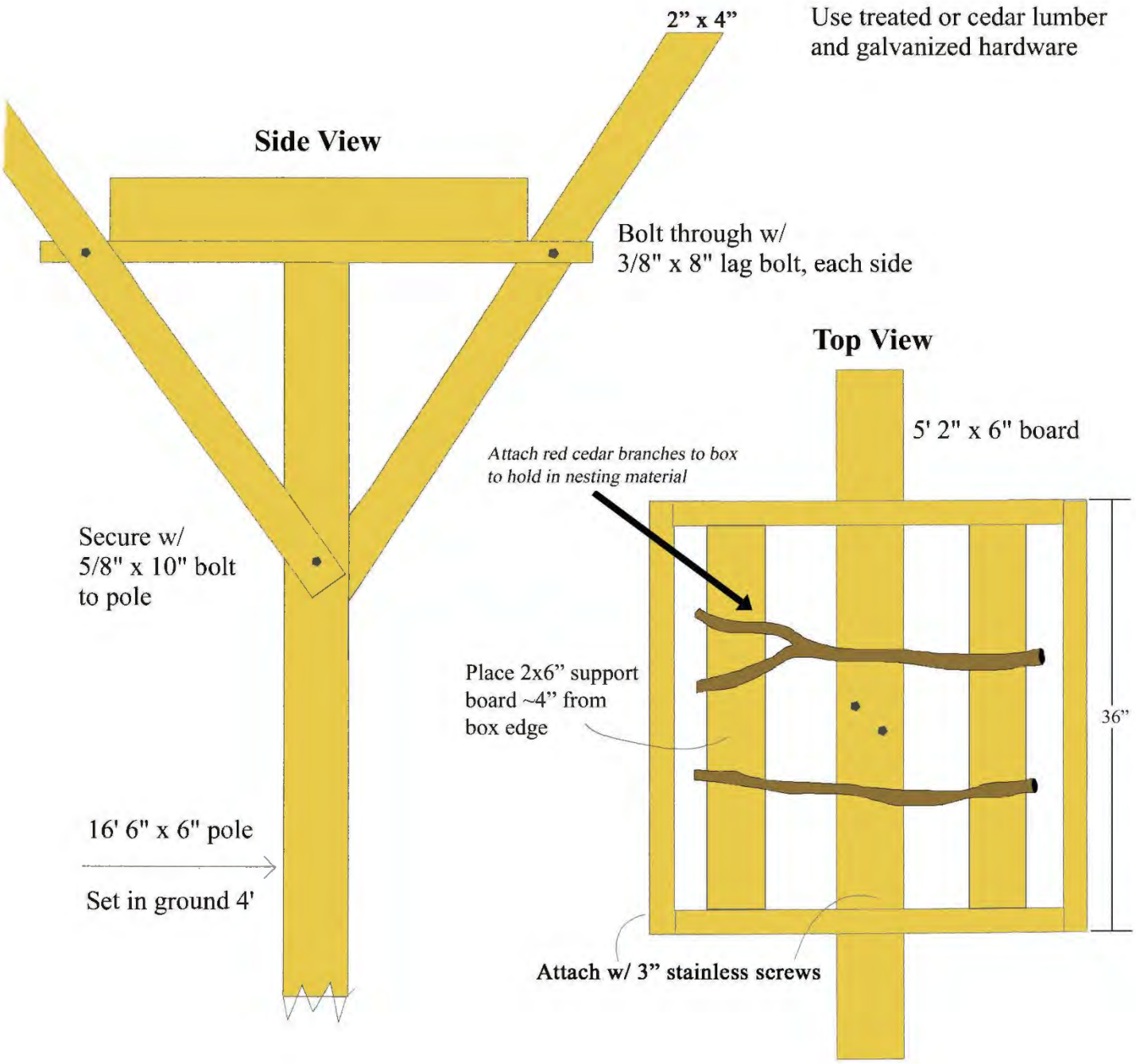
Fish and Wildlife

Conserve Wildlife
Foundation of New Jersey



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