

YAQUINA BAY ESTUARY MANAGEMENT PLAN

August 2023

DRAFT

NOT ADOPTED

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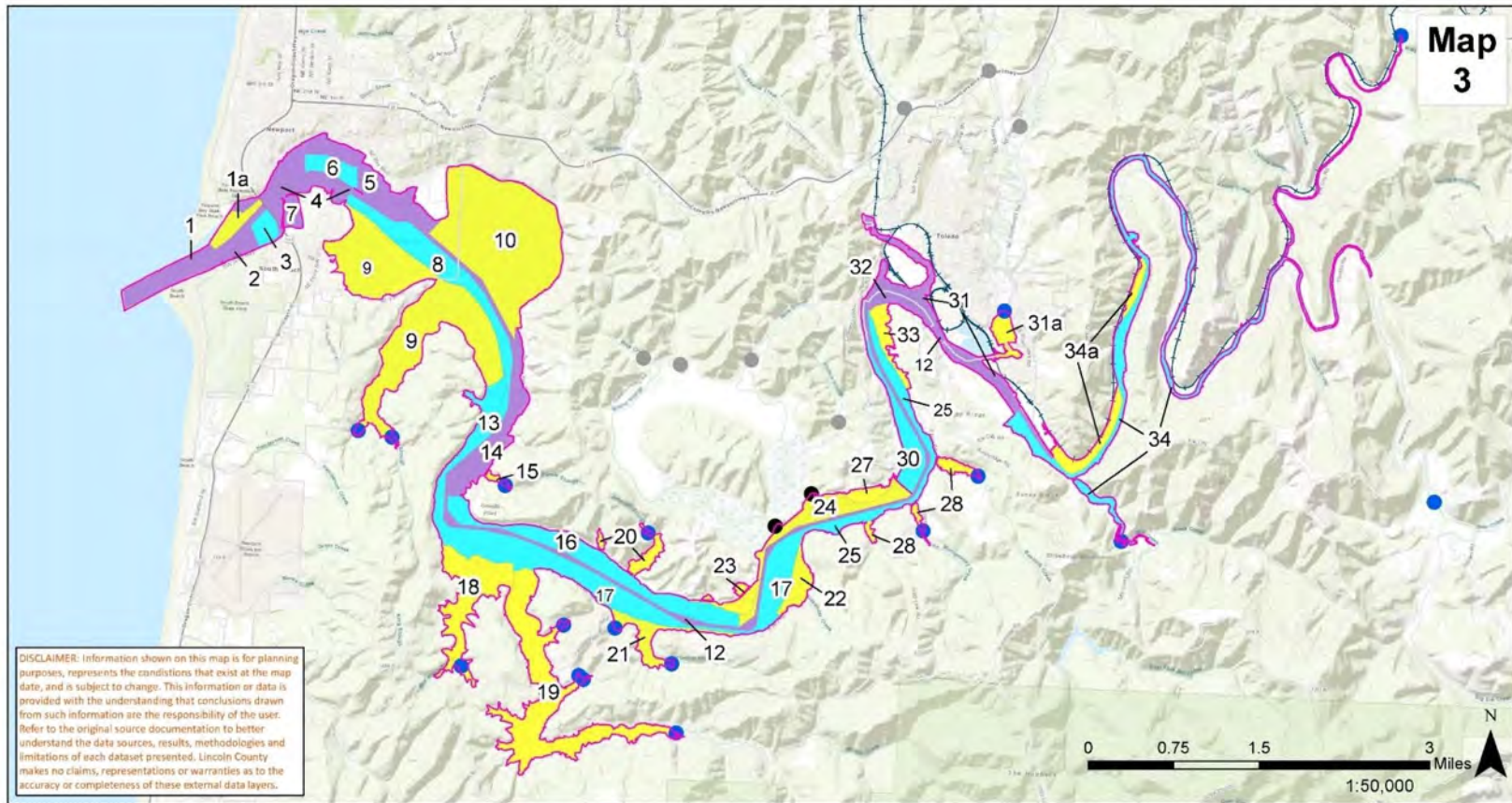
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PART I - INTRODUCTION

Proposed revisions as part of the 2023 update

Overview

The Lincoln County Estuary Management Plan (Plan) is a special area plan, as defined by the federal Coastal Zone Management Act (CZMA), that governs estuarine resource conservation and development decisions in four major estuaries (Yaquina Bay, Alsea Bay, Siletz Bay, and Salmon River estuaries), and three minor estuaries (Big Creek, Beaver Creek, and Yachats River estuaries). The Plan is administered at the local level by Lincoln County, the City of Lincoln City, the City of Newport, the City of Toledo, the City of Waldport, and the City of Yachats for areas within their respective jurisdictions. As prescribed by Oregon Statewide Planning Goal 16: Estuarine Resources, the Plan regulates alterations and uses within estuarine areas, which are defined as estuarine waters, tidelands, tidal marshes and submerged lands up to the line of Mean Higher High Water (MHHW) or the line of non-aquatic vegetation, whichever is further landward. For purposes of this plan, the jurisdictional extent of estuaries extends upstream to the head of tide. (See Figure 1. Yaquina Bay Regulatory Extent and Head of Tide Map). Adjoining shorelands are subject to separate, coordinated land use regulations. The original Plan was adopted in 1982. The Yaquina Bay portion of the Estuary Management Plan was comprehensively updated in 2023.



Yaquina Bay Estuary Regulatory Boundary, Management Units, and Head of Tide

This map is a draft interim product of the Yaquina Bay Estuary Management Plan Update process intended to inform decision-making. This map is not the finalized product.

Date: 6/7/2023, Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
Data Source: Lincoln County, "YEMP_MUs", (2023); Department of State Lands, "HeadTides_17" (n.d.) [data reference updates pending]

Figure 1. Regulatory Boundary, Estuary Management Unit Classifications, & Head of Tide

Original Lincoln County Estuary Management Plan

In 1976, the State of Oregon adopted Statewide Planning Goal 16: Estuarine Resources, which requires coastal jurisdictions to develop and adopt estuary management plans in compliance with the Goal's requirements. In addition to coastal Statewide Planning Goals 17-19, the adoption of Goal 16 supported the State of Oregon in meeting the requirements of the federal Coastal Zone Management Act of 1972. These goals and their adherence through local Comprehensive Plans ensures the continued approval of Oregon's Coastal Management Program, which is a networked program of all cities, counties, and state agencies within Oregon's Coastal Zone and administered through the Department of Land Conservation and Development.

Statewide Planning Goals interact with each other to varying degrees. In particular, Goal 17 - Coastal Shorelands, outlines planning and management requirements for the lands bordering estuaries. It should be noted that while these two Goals are immediately adjacent to each other, in Lincoln County Goal 16 is administered through the estuary management plan whereas Goal 17 is administered through the zoning code.

The purpose of Goal 16 and all estuary management plans is "to recognize and protect the unique environmental, economic, and social values of each estuary and associated wetlands; and to protect, maintain, where appropriate develop, and where appropriate restore the long-term environmental, economic, and social values, diversity and benefits of Oregon's estuaries." Plans are paired with mapped resource inventories describing physical, biological, social, and economic conditions. Four major estuaries and three minor estuaries are within the jurisdiction of Lincoln County. Of the major estuaries, Salmon River, Siletz Bay and Alsea Bay are of primary importance as recreation areas, while Yaquina Bay is one of three major development estuaries on the Oregon Coast with a deep water navigation channel and turning basin federally authorized by the United States Army Corps of Engineers and a major port. In many ways, the County's estuaries serve as a focal point for the local economy.

In 1982, Lincoln County adopted the Lincoln County Estuary Management Plan to manage the increasing number of demands placed on its estuaries by an expanding economic base and growing population. A major goal of the Plan is to reduce conflict between the various groups that seek to use the resources of the estuary and the agencies responsible for managing those resources.

Responsibilities for making decisions about the use of the land and water resources of estuarine areas fall to a wide variety of local, state, and federal agencies. Each agency that has some authority uses a plan or follows codified regulations to make management decisions. The cities and county have comprehensive plans; the U.S. Army Corps of Engineers, U.S. Fish and Wildlife

Service, U.S. Environmental Protection Agency, Oregon Department of Fish and Wildlife, Oregon Department of State Lands, and other state and federal agencies each have their own regulations. The result is that the process for making decisions and obtaining permits can be confusing, uncertain, and often frustrating for the individuals involved.

The development of the original Estuary Management Plan was brought about through the combined efforts of local government, concerned citizens, industry and state and federal agencies working within the framework of the Statewide Planning Goals and the Oregon Coastal Management Program. The emphasis of this program is to resolve conflicts over use and development of coastal resources through the development of coordinated comprehensive plans. As an element of these coordinated comprehensive plans, the Estuary Management Plan represents an overall management scheme for the resources of the estuaries which reflects not only local interests, but also incorporates the concerns of affected state and federal agencies.

The final decisions contained in this Plan often reflect considerable compromise made by all parties involved. While it was not possible to completely satisfy all participating interests, the concerns and viewpoints of all interests were thoroughly considered. A sincere effort was made to balance the sometimes conflicting needs to preserve dwindling natural resources and provide needed opportunities for economic growth and stability.

2023 Update to the Yaquina Bay Component of Lincoln County Estuary Management Plan

The original Plan, adopted in 1982, was based on the economic, demographic, and environmental conditions at the time. A lot has changed since 1982, not just in Yaquina Bay and the economic and demographic composition of the communities in the region, but also how people use and value its waters and ecosystems. To guide the update of the Yaquina Bay component of the Lincoln County Estuary Management Plan, a Steering Committee was formed consisting of representatives of DLCD, Lincoln County, the Cities of Newport and Toledo, the Ports of Newport and Toledo, and the Confederated Tribes of Siletz Indians. In addition to updating the Plan to address current conditions, technologies like Geographic Information Systems (GIS) have been utilized to improve the usability of the Plan. The Plan's original hand-drawn maps have been replaced by GIS mapping which more accurately depicts important planning and regulatory boundaries. Updates to the resource inventory maps were completed and informed updates to applicable Plan Parts such as VI-Management Units. As described in Goal 16's guidelines, "the strong relationship between estuaries and adjacent coastal shorelands, the inventories and planning requirements for these resources should be closely coordinated." The 2023 update completed this by updating maps describing the current physical, biological, social, and economic conditions, as well as updates to the Restoration Site List (see Figure 3) and Landward Migration

Zone maps 17 and 21 respectively also that describe coastal shorelands that could become within the estuary's regulatory extent due to sea level rise or restoration activities.

Another major aspect of the update was the incorporation of information and concerns that have emerged since the Plan was originally adopted. This includes incorporating climate change considerations in the planning of proposed alterations in Yaquina Bay as well as descriptions of Tribal rights and access for cultural practices.

As in during the original Plan adoption, the update has involved public participation and groups who value a healthy Yaquina Bay for the habitat and ecosystem services it provides and the local economy and livelihoods it supports. Ecosystem services are positive benefits that ecological systems, habitats, or wildlife provide to humans. Yaquina Bay's estuary provides ecosystem services to nearby residents and the Cities of Newport and Toledo that include mitigation of the impacts of flooding due to storm surges, improvements in water quality through vegetation and substrate filtration, and improvements in air quality through plant photosynthesis and respiration. The cultural significance of this area as well as opportunities for recreation are also considered important ecosystem services. In addition, much of the local economy is built upon productive seafood and fish harvesting and processing such as Dungeness crab which require eelgrass and other estuarine habitats for their lifecycle. Lastly, the sequestration and storage of carbon by the estuary's subtidal and intertidal plants benefits residents of the State of Oregon and beyond by helping attenuate carbon dioxide contributions to climate change and its projected impacts. Note that this is not intended to be an exhaustive list of all of the myriad of ecosystem services Yaquina Bay provides to people.

How to Use the Plan

The Estuary Management Plan provides an overall, integrated management scheme for estuarine aquatic areas in Lincoln County. Lincoln County retains overall responsibility for development and coordination of the Estuary Management Plan for estuaries in the county except for Depoe Bay, which is wholly within the jurisdiction of the City of Depoe Bay. City comprehensive plans incorporate relevant portions of the Estuary Management Plan. Amendments to any element of the Plan will be coordinated by Lincoln County with the affected cities, ports, State and Federal agencies.

The Plan contains comprehensive provisions for guiding estuarine development and conservation activities, from broad overall policies to site specific implementing measures.

The planning and decision-making framework of the Estuary Management Plan is contained within a concept of descending levels of policies: Overall Management Policies to Sub-Area Policies to individual Management Units. Each level of policy and the size of the area to which

those provisions apply is smaller and more specific than the preceding level, ending with site specific guidelines at the management unit scale.

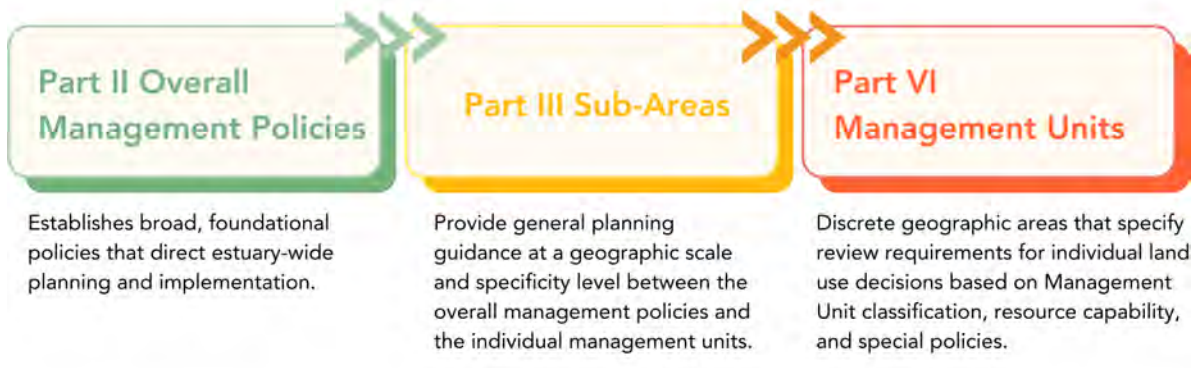


Figure 2. Policy Visual

Estuary and estuary-adjacent property owners or agencies seeking to alter or use the estuary should consult the individual management unit(s) encompassing their properties. To determine the permissibility of a proposed alteration or use of the estuary, consult the classification of the relevant Management Unit(s), the Estuary Zoning Districts which describe the permitted and conditional, uses or activities applicable to each Classification(s), and consult the applicable jurisdiction (city or County) to discuss the proposed project.

In the Estuary Management Plan, three levels of policy are established:

Overall Management Policies (Plan Part II)

Overall estuary management policies are established for the entire county. These policies are very broad and general in nature and are designed to say, in essence, that "...this is how we expect to manage uses and activities within the estuary..." and "...this is what we expect to achieve through this management...".

Sub-Area Policies (Plan Part III)

The size and complexity of the Yaquina Bay estuary required a second level of policy; the Sub-Area Policy. The estuary has been divided into seven sub-areas, each representing a

common set of natural and human-related features. Sub-areas provide a basis for describing how different areas of the estuary presently function and how they should be planned to function in the future. Each sub-area is described in terms of its existing character; its major committed uses; its existing and potential conflicts; and its climate vulnerabilities. Policies are established for each sub-area on the management of the sub-area's natural resources and on development within the sub-area. These policies serve to guide the establishment of management unit designations and specific implementation measures.

Management Units (Plan Part VI)

The third level of policy in the Estuary Management Plan is the Management Unit. This is the most specific policy level and is designed to provide specific implementing provisions for individual project proposals. Each unit is given a management classification (defined in Part IV) of Natural, Conservation, or Development. These classifications are based on the resource characteristics of the units as determined through an analysis of resource inventory information. The classification carries with it a general description of intent and a Management Objective. Each management unit objective is implemented by its applicable Estuary Zoning District (see Part X - Implementation) which specifies uses and activities that are permitted or conditional within the unit. Many management units also contain a set of Special Policies that relate specifically to that individual unit.

In addition to the three basic policy levels, the Estuary Management Plan also contains a number of other sections, each with a specialized role in guiding overall estuary management.

Estuarine Use Standards (Plan Part V)

This part of the Plan has detailed development standards for 14 categories of uses and activities (structures, dredging, etc.). These standards will be applied to all new uses and activities within the estuaries as a part of the Plan implementation process. This part of the Plan was not revised during the 2023 update.

Restoration and Mitigation (Plan Part VII)

This section includes a general description of restoration, its relation to mitigation as required by Oregon Law, and an overall policy concerning restoration. It includes a general assessment of estuarine mitigation needs and an identification of sites to be protected in fulfilling the mitigation planning requirements of Goal 16. The list of potential restoration sites and projects in the estuaries has been updated and moved to Appendix E as a document and in the spatial inventory as Figure 2. Restoration Sites.

Future Development Sites (Plan Part IX)

This part of the Plan includes a summary of projected development needs and a summary of potential development sites. Its purpose is to address concerns which are presently beyond the

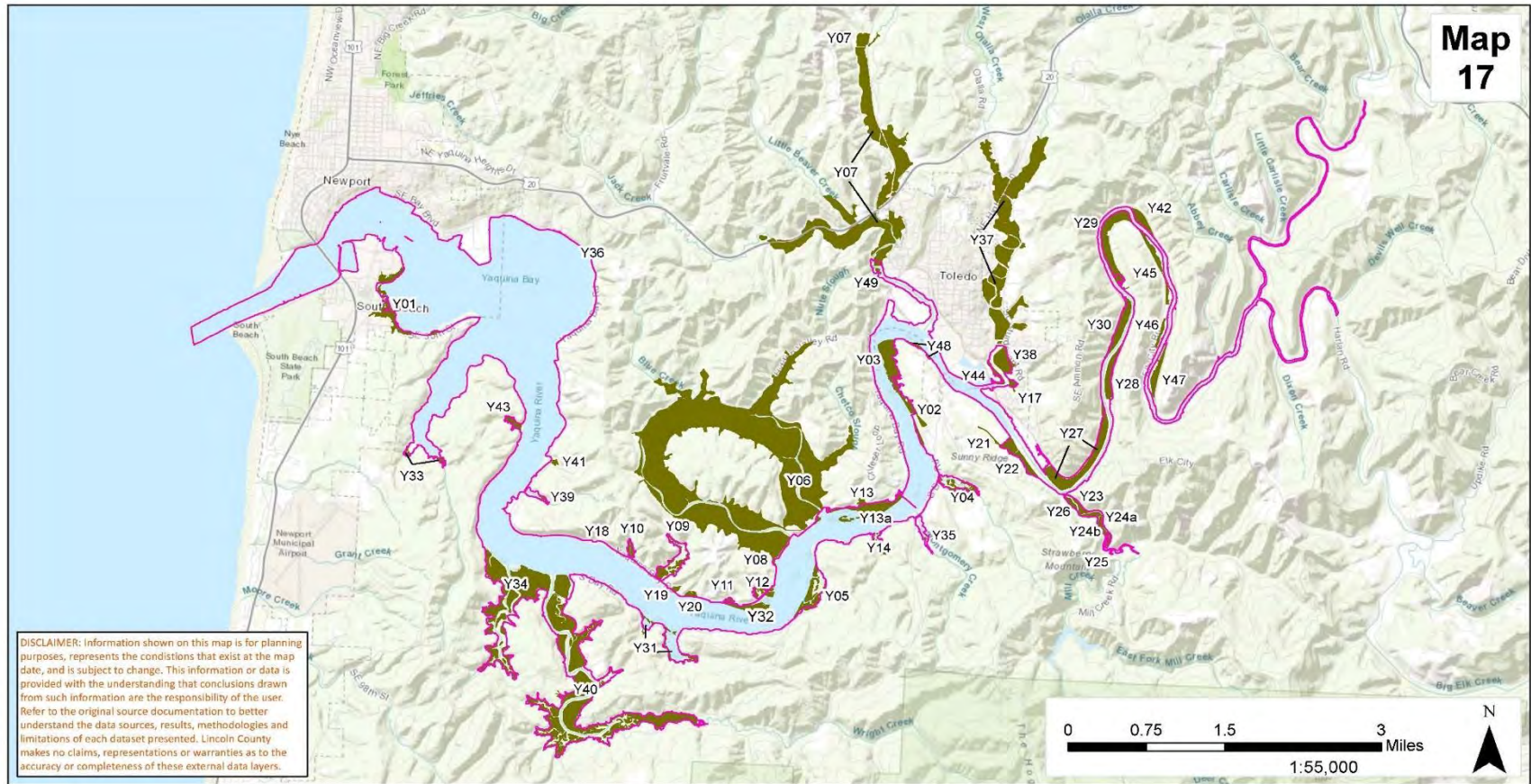
scope of the specific management unit framework to provide general, long-term direction to future development. This part of the Plan was not revised during the 2023 update.

Plan Implementation (Plan Part X)

This section of the Plan provides the administrative procedures for implementing the Plan's substantive requirements. It describes required local land use review procedures and specifies the content of local land use regulations necessary to implement the Plan and comply with Goal 16 requirements. Also included is a general description of the principal state and federal regulatory authorities involved in estuarine activities and development.

Dredge Material Disposal Plan

The Lincoln County Dredged Material Disposal Plan is a companion document to the Estuary Management Plan. It describes the location and procedures for use of dredged material disposal sites. Dredging needs over the next 20 years were estimated and sites located to handle the disposal of the material. This part of the Plan was not revised during the 2023 update as the disposal of dredged material in estuarine areas is regulated by the United States Army Corps of Engineers and the Oregon Department of State Lands.



Restoration Sites

See reports cited below for descriptions of each restoration site.

Date: 5/30/2023, Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Int
 Data Source: Brophy, L.S. 2012. Tidal Wetlands of the Yaquina and Alsea River Estuaries, Oregon: Geographic Information Systems Layer Development and Recommendations for National Wetlands Inventory Revisions. USGS Open-File Report 2012-1038. U.S. Dept. of the Interior, U.S. Geological Survey.
<https://pubs.usgs.gov/of/2012/1038/methods.html>

This map is a draft interim product of the Yaquina Bay Estuary Management Plan Update process intended to inform decision-making. This map is not the finalized product.

Data Source: Brophy, L.S. 1999. Final report—Yaquina and Alsea River Basins estuarine wetland site prioritization project. Report prepared for the MidCoast Watersheds Council, Newport, Oregon, Green Point Consulting, Corvallis, Oregon, 50 p.
<https://doi.org/10.13140/RG.2.2.26654.20803>

Legend

Restoration Sites Estuary Boundary

Data Source: Brophy L.S., Greene C.M., Hare V.C., Holycross B., Lanier A., Heady W.N., O'Connor K., Imaki H., Haddad T., and Dana R. 2019. Insights into estuary habitat loss in the western United States using a new method for mapping maximum extent of tidal wetlands. PLOS ONE 14(8): e0218558.
<https://doi.org/10.1371/journal.pone.0218558>.

Figure 3. Restoration Sites

Resource Inventories

As part of Lincoln County's Comprehensive Plan, detailed resource inventories of the County's estuarine areas have been adopted. Inventories have been conducted to provide information necessary for designating estuary uses and policies. These inventories provide information on the nature, location, and extent of physical, biological, social, and economic resources in sufficient detail to establish a sound basis for estuarine management and to enable the identification of areas for preservation and areas of exceptional potential for development.

Inventories include maps and sourced spatial data on the following resources and information: Coastal Marine and Ecological Classification Standard (CMECS), port facilities and tide gates, current planning extent, historical estuarine boundaries and vegetation, head of tide, sea-level rise projections, landward migration zone projections, and restoration sites. More information on CMECS data and what the various features (e.g.: substrate types, wetland types, etc.) can be found in Appendix G – CMECS Data Descriptions. The information contained in the Plan's management unit descriptions and resource capability assessments is based on factual base material drawn from these comprehensive resource inventories. The rationale for permitted use decisions and management classifications is contained in these brief factual base summaries; for detailed resource information and a bibliography of documents included in the inventory, the Lincoln County Comprehensive Plan Inventory should be consulted.

Climate Change and Vulnerabilities

As part of the 2023 update to the Plan, climate change as a management consideration has been incorporated throughout the Plan, including Plan Parts I Introduction, III Sub-Areas, VII Mitigation and Restoration, X Implementation, and to the spatial inventories. As proposed alterations in the estuary have the potential to be in place for decades, impacts from climate change can jeopardize their continued use and potentially lead to negative outcomes that could threaten the unique environmental, economic, and social values of Yaquina Bay.

The long-term shifts in temperatures and weather patterns globally indicate a changing climate.¹ Shifts in climate can be natural, but since the 1800s, human activities have been the primary driver of climate change. Heat reflected off the earth from the sun is staying in our atmosphere at a higher rate than it was centuries ago due to the increased presence of greenhouse gases, equating to higher average annual global temperatures. Higher surface temperatures contribute to shifts in meteorologic conditions. Those conditions allow for "greater droughts, flooding events, extreme storms, extreme heat, extreme polar vortex events, increased melting of land ice, and others."^{1,2}

¹ United Nations Intergovernmental Panel on Climate Change (IPCC): Definition of Climate Change (2022)

² University of California at Davis: Climate Change Terms and Definition - Polar Vortex (2022)

However, increased temperatures are only one of many changes projected to impact Yaquina Bay and the people, species, and ecosystems that call this area home.

The following are projected climate change impacts for the Yaquina Bay:

Global sea level rise is projected to increase Yaquina Bay's Mean Higher High Water mark by a range of 0.8 to 6.1ft by 2100.³ There is a lot of uncertainty due to the unknowns around greenhouse gas emissions into the future. After 2000 years of relative stability, average global sea levels have risen about 8 inches in the last 100 years.⁴

More acidic estuary waters are likely, as open ocean waters are projected to be acidic enough to dissolve the biogenic carbonate shells of shellfish by 2100.⁵ As the ocean absorbs CO₂, its pH is lowered and is more acidic. "Since 1750, the pH of seawater has dropped significantly (about 0.1 globally). That means water is about 1 ¼ times more acidic today."⁶

Warmer summers with more extreme heat days and periods of drought. The average annual temperature in Oregon increased by 2.2 degrees Fahrenheit from 1895 to 2019.¹ Temperature increases local to the City of Newport, OR and the broader Yaquina Bay region are projected for an average daily temperature of 3-4 degrees higher by 2050 (NOAA Climate Explorer 2022).

More rain in fewer and bigger storms instead of snow during winter months at higher elevations. Despite an expected overall increase in winter precipitation, the past 50 years have documented a 60% or greater reduction in snow water recorded annually on April 1st for Columbia River tributaries.⁷

³Sweet, W.V., et al. 2022. Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines. NOAA Technical Report. National Oceanic and Atmospheric Administration, National Ocean Service, Silver Spring, MD.

⁴ U.S. Global Change Research Program. 2009. Global climate change impacts in the United States: a state of knowledge report. New York: Cambridge University Press.

⁵ Feely et al. 2008. Barton, A, B. Hales, G. G. Waldbusser, C. Langdon, R.A. Feely. 2012. The Pacific oyster, *Crassostrea gigas*, shows negative correlation to naturally elevated carbon dioxide levels: Implications for near-term ocean acidification effects. *Limnology and Oceanography*, 57(3): 698-710.

⁶ Feely, R. A, C. L Sabine, J. M Hernandez-Ayon, D. Ianson, and B. Hales. 2008. Evidence for upwelling of corrosive "acidified" water onto the continental shelf. *Science* 320, no. 5882: 1490.

⁷ Oregon Department of Fish and Wildlife: The Oregon Conservation Strategy Fact Sheet Climate Change and Oregon's Estuaries (YEAR)

Planning for Projected Impacts and Secondary Effects

Lincoln County's estuaries and communities are facing unprecedented challenges from changing ocean and climate conditions. The overall management of each estuary will consider the principles in Oregon's Climate Adaptation Framework including embracing flexibility in uncertainty, recognizing that climate change is a 'stress multiplier', and acknowledging that impacts will not be borne equally by all people in a community.

These climate change impacts are expected to create secondary effects such as increased risk to and prevalence of forest fires, bay and riverine flooding, loss of protected habitats and species, loss and landward migration of coastal habitats, loss of fisheries habitat relied upon by the local fishing economy, loss of eelgrass and other macrophytes due to heat waves⁸, stress on ESA-listed fish, destabilizing infrastructure in and on the Bay, erosion and accretion changes, sediment and nutrient loading, and many more.

As in the original Plan adoption, potential cumulative impacts of alterations and development activities were considered during plan development. The 2023 update to the Plan also includes a section on Climate Vulnerabilities (Part III) to inform required Impact Assessments (Part X). The development of Climate Vulnerabilities for each sub-area and integration of those into Impact Assessments was added to further assess potential impacts, interactions, and secondary effects of proposed alterations and activities within Yaquina Bay under future conditions.

Plan Part III - Sub-Areas includes Climate Vulnerabilities for each sub-area within the estuary that describe anticipated secondary effects specific to each sub-area.

Plan Part X - Implementation includes updates to the Impact Assessment process to ensure that proposed alterations consider potential interactions with the Climate Vulnerabilities in applicable sub-area(s).

Appendix D - Climate Vulnerabilities is the full list of all climate vulnerabilities included in Plan Part III - Sub-Areas.

⁸ Front. Mar. Sci., 01 April 2022. Differential Responses of Eelgrass and Macroalgae in Pacific Northwest Estuaries Following an Unprecedented NE Pacific Ocean Marine Heatwave. Sec. Coastal Ocean Processes Volume 9 - 2022. <https://doi.org/10.3389/fmars.2022.838967>

PART II – OVERALL MANAGEMENT POLICIES

Proposed revisions as part of the 2023 update

Overall Management Policies

1. Lincoln County's estuaries represent an economic resource and provide vital ecosystem services of regional importance. The overall management of each estuary shall ensure adequate provision for protection of the estuarine ecosystem, including its biological productivity, habitat, diversity, unique features and water quality, and development, consistent with the Overall Oregon Estuary Classification and according to the following general priorities (from highest to lowest). The prioritization of management policies within this plan is not intended to reduce or alter the tribal trust responsibilities of the federal government:
 - a. Uses which maintain the integrity of the estuarine ecosystem;
 - b. Water dependent uses requiring an estuarine location;
 - c. Water related uses which do not degrade or reduce natural estuarine resources and values;
 - d. Non-dependent, non-related uses that do not alter, degrade or reduce estuarine resources or values and are compatible with existing and committed uses.
2. Lincoln County's estuaries support a variety of vitally important natural resources that also support the major economic sectors of the County. The overall management of each estuary shall include adequate provision for both conservation and preservation of natural resources. This will include consideration of culturally important tribal resources.
3. Lincoln County's estuaries represent a recreational resource of both local and statewide importance. Management of each estuary shall protect recreational values and ensure adequate public access to the estuary. This will include consideration of culturally important tribal resources. This will include consideration of access to culturally important tribal resources.
4. Dredging and/or filling shall be allowed only:
 - a. if required for navigation or other water dependent uses that require an estuarine location or if specifically allowed by the applicable management unit requirements of this plan; and

- b. if a need (e.g., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights or tribal cultural resources or practices; and
- c. if no feasible alternative upland locations exist; and
- d. if adverse impacts are minimized.
- e. other uses and activities which could alter the estuary shall only be allowed if the requirements in b., c., and d. are met.

PART III – SUB-AREAS

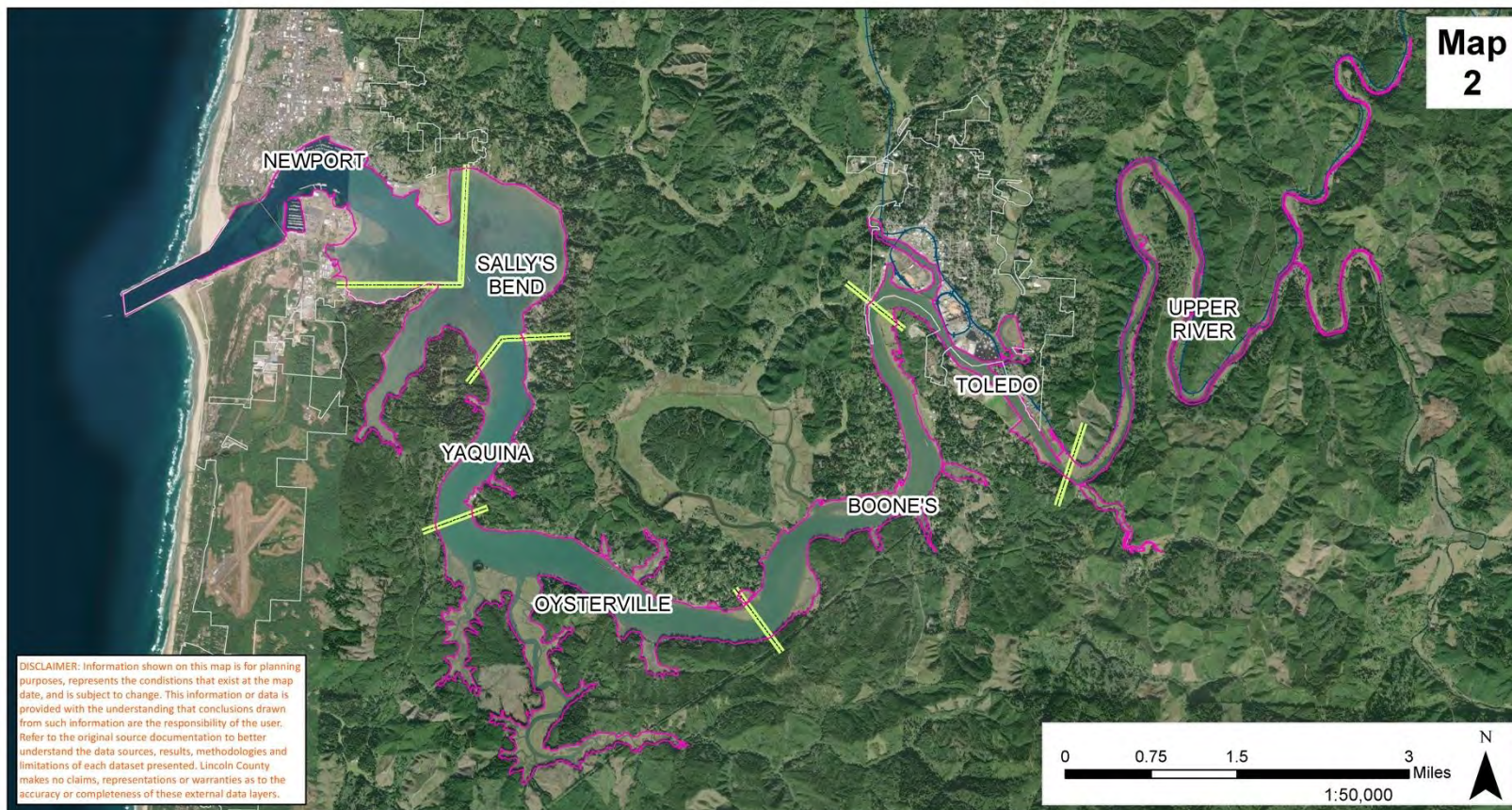
Proposed revisions as part of the 2023 update

Introduction

Due to the size and complexity of the Yaquina Bay estuary system, an additional tier of policy has been established at the sub-area level. The sub-area policies are intended to provide general planning guidance at a geographic scale between the overall management policies and the individual management unit level.

For this purpose, the estuary has been divided into seven sub-areas, each representing a common set of natural and anthropogenic features. (See Figure 4. Yaquina Bay Sub-Areas) These sub-areas provide a basis for describing in broad terms how different reaches of the estuary presently function and are used, and to identify considerations in planning for future use and conservation. Each sub-area is described in terms of its existing character, its major committed uses, and its existing and potential conflicts. Policies are established for each sub-area for the purpose of guiding the establishment of management unit designations and specific implementation measures.

Sub-area policies are intended to serve as general guidance for overall spatial planning; they are not applicable approval criteria for individual project or permit reviews. The criteria applicable to individual land use decisions for estuarine development proposals are as set forth in pertinent implementing land use regulations. These include Plan Parts II, IV, V, VI, VII, and X.



Yaquina Bay Sub-Areas

This map is a draft interim product of the Yaquina Bay Estuary Management Plan Update process intended to inform decision-making. This map is not the finalized product.

Date: 8/24/2023, Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
Data Source: Lincoln County, "YEMP_MUs", (2023)

Figure 4. Yaquina Bay Sub-Areas

Newport Sub-Area

Predominant Character

The Newport sub-area is a high intensity use area. It is the hub of commercial fishing, deep water shipping and research, and tourist related commercial activities on Yaquina Bay. Adjacent shorelands are urban in character and the shoreline is mostly continuously altered throughout the sub-area. Aquatic area alterations within the sub-area are extensive. Major alterations include dredging, jetties and other navigation improvements, intertidal fills, and numerous in-water structures, including docks, piers, wharfs and breakwaters. As a fully serviced urban area in close proximity to the harbor entrance and with shoreland access to the deep-water navigation channel, the Newport sub-area represents the most important portion of the estuary for water dependent development.

Important natural resources within the sub-area include eel grass and algal beds, shellfish beds and fish spawning and nursery areas.

Major Committed Uses

The sub-area contains a mix of water dependent, water related and non-water related uses. Industrial uses are concentrated at McLean Point (Northwest Natural's LNG (liquid natural gas) tank and the Port of Newport's International Terminal) and along the Newport waterfront. A recreational marina and a number of non-water related tourist oriented commercial uses also occur along the Newport waterfront. Major uses in the South Beach area include the Oregon State University (OSU) Hatfield Marine Science Center, the South Beach Marina recreational complex, the NOAA Marine Operations Center - Pacific facility and the Oregon Coast Aquarium. Many entities residing in the South Beach area provide experiential educational opportunities for tens of thousands of students and families every year. The sub-area takes in the major components of the authorized Corps of Engineers navigation project, including the jetties, the main navigation channel and turning basin, the boat basins, and related navigation improvements. Recreational use in the sub-area, including sport fishing, crabbing, clamming, diving and boating, is heavy. In some years, a limited commercial herring fishery occurs within the sub-area.

Existing and Potential Conflicts

Several conflicts exist within the sub-area. Conflicts have developed between tourist oriented commercial uses and water dependent commercial and industrial uses along the Newport waterfront. These conflicts involve both competition for available space as well as use conflicts (e.g., traffic, parking, etc.) between established uses. As demand accelerates for both types of uses, conflicts may worsen. In the past, competition between recreational and commercial vessels for moorage has been a problem, however the opening in 1980 of approximately 500 moorage spaces designed to accommodate recreational vessels at the South Beach Marina has largely

alleviated this conflict. The maintenance and redevelopment of water dependent uses in the sub-area will necessitate development in aquatic areas, posing a potential conflict with the protection of natural resources in some portions of the sub-area.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Increased shoreline erosion due to changes in sediment transport or deposition patterns or increased intensity of storm surges;
- Increased frequency and extent of storm surge flooding due to sea level rise risking the integrity and hindering the use of critical infrastructure;
- Increased risk of jetty or breakwater failures due to sea level rise and storm surge;
- Increased risk of loss of structural integrity to underground or submerged infrastructure due to higher water tables from sea level rise;
- Increased risk of sea level rise submerging port, marina, and other moorage infrastructure;
- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge;
- Increased frequency and extent of storm surge flooding due to sea level rise of bay-adjacent industrial and waste treatment sites increasing risk of structural damage and pollution events;
- Increased risk of toxic leaks from erosion and destabilization of submerged sewer, natural gas and other pipes and utility lines due to changes in sediment transport and deposition patterns;
- Aquaculture and recreational shellfish losses due to ocean acidification and dissolution of oyster shells;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall;
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes;
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges);

- Increased risk to current dredging regime or location of navigation channels as erosion and accretion patterns change due to sea level rise and storm surge.

Sub-Area Policies

1. The primary objective in the Newport sub-area shall be to manage for the development of water dependent uses, including but not limited to deep draft navigation, marine research, and commercial fishery support facilities.
2. In general, non-water related uses shall not occupy estuarine surface area. However, limited non-water related uses may be permitted in keeping with the scenic and historic waterfront community on the north side of the sub-area.
3. Adverse impacts of development on natural resources and established recreational uses shall be minimized.
4. Land uses of adjacent shorelands should be consistent with the preferences and uses of other sub-areas.

Sally's Bend Sub-Area

Predominant Character

The Sally's Bend sub-area represents one of the most important natural resource areas of Yaquina Bay. It is essentially undeveloped and includes eel grass and algal beds, shellfish beds, fish spawning and nursery areas, and wildlife habitats, all of major significance. The area's intertidal flats represent the largest tract in the estuary. Mature native Olympia oysters have been found in this sub-area in patches on any type of hard surface, such as rock, oyster shells, pilings, and fixed woody debris or other stationary hard surface.

Major Committed Uses

The predominant use of the sub-area is for hunting, sport angling and recreational shellfish harvest. Low intensity commercial oyster production takes place in King Slough. The Yakona Nature Preserve & Learning Center engages youth, young adults and the community through the arts, history and the sciences by way of active engagement in climate research, habitat restoration, and discovery-based learning. The sub-area also includes a portion of the navigation channel that supports medium draft (18 feet authorized depth) commercial navigation. Adjacent shoreland uses consist primarily of low-density housing and commercial forest management. Industrial uses are adjacent (though they do not extend into the sub-area) at McLean Point and South Beach. Portions of the sub-area have historically been used for log storage, though no current log storage activities are present.

Existing and Potential Conflicts

No major conflicts exist within the sub-area, though potential for conflict is present at several locations. Demands for urban level development in the Idaho Point area (which is within the

Newport urban growth boundary) may be incompatible with preservation of natural values in the adjacent portion of the estuary. Industrial development at McLean Point and in the Coquille Point area may impact important resource areas at Sally's Bend. If increases in deep water shipping precipitate a demand for expansion of the current navigation channel and turning basin, some loss of natural resource values would result from the required dredging.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Aquaculture and recreational shellfish losses due to ocean acidification that impairs the formation of oyster shells;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Increased risk of shoreline protection structures, pilings, or jetties becoming underwater hazards due to sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall;
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes;
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges);
- Water damages to housing structures or mobile homes from riverine flooding due to sea level rise;
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk to current dredging regime or location of deepwater channel as erosion and accretion patterns change due to sea level rise and storm surge;
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise.

Sub-Area Policies

1. The primary objective in the Sally's Bend sub-area shall be to preserve and protect natural resources.
2. It is recognized that some alteration of the sub-area will be required in conjunction with the maintenance and possible expansion and/or deepening of the deep water navigation

channel and turning basin. Other alterations shall be limited to those that are consistent with the overall protection of natural resource values, or those undertaken in conjunction with restoration projects.

3. To maintain recreational values, commercial shellfish harvest by mechanical means should not be permitted above extreme low water.
4. Low intensity land uses which do not adversely impact estuarine natural resource values shall be preferred on adjacent shorelands.
5. Identified areas of important wildlife habitat shall be protected.

Yaquina Sub-Area

Predominant Character

The Yaquina sub-area is a mixture of medium intensity development (east shore) and areas of sparse or no development (west shore). The primary character of the area is derived from the concentration of water dependent and water related uses along the east shore of the estuary. Major natural resources within the sub-area include important fish spawning and nursery areas, shellfish beds, and eel grass and algal beds. Areas of important wildlife habitat are concentrated on the undeveloped west shore. Mature native Olympia oysters have been found in this sub-area in patches on any type of hard surface, such as rock, oyster shells, pilings, and fixed woody debris or other stationary hard surface.

Major Committed Uses

On the east shore, between river mile 3.5 and 5.3, the available shoreline is mostly developed with water dependent and water related uses. These uses include two developed marina facilities, three marine construction and repair facilities, and several commercial fishing related gear storage and maintenance facilities. Rural residential use is also concentrated along the east shore, mostly on the upland side of Yaquina Bay Road. Aquatic area alterations are extensive along the east shore, including piers, pilings, floating docks, intertidal fills and armored shorelines. The west shore and adjacent aquatic area are essentially undeveloped. A substantial portion of the land area on the west shore is held in conservation ownership (Yakona Nature Preserve & Learning Center) and is managed for the conservation of natural resources. The remainder is in private forest ownerships.

Existing and Potential Conflicts

The Yaquina sub-area is moderately developed with potential for additional development. The sub-area also has characteristics that make it suitable for aquaculture. Conflicts could develop over demands for additional aquatic area development and the need for maintenance of water quality for aquaculture. The east side of the estuary is currently closed to commercial shellfish harvest because of potential contamination. Occupation of surface area by aquaculture activities

may conflict with navigation and recreational activities. Lack of adequate facilities and services to the area may pose constraints on water dependent development.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Increased shoreline erosion due to changes in sediment transport and deposition patterns or increased intensity of storm surge;
- Increased demand for shoreline protective structures due to increased erosion from sea level rise and storm surge;
- Aquaculture and recreational shellfish losses due to ocean acidification that impairs the formation of oyster shells;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall;
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes;
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges);
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk of tide gates and dike failures due to sea level rise and storm surge;
- Increased risk to current dredging regime or location of navigation channels as erosion and accretion patterns change due to sea level rise and storm surge;
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise.

Sub-Area Policies

1. It is recognized that demand for development in the lower estuary may exceed available space in the Newport urban area. Water dependent development should be

accommodated along the east shore of the Yaquina sub-area consistent with available levels of public facilities and services.

2. The portion of the sub-area west of the navigation channel shall be managed to conserve natural resources, protect water quality, and maintain overall suitability for aquaculture.
3. Occupation of estuarine surface area by in-water structures shall not interfere with the use of the navigation channel and should not unreasonably interfere with established recreational uses within the sub-area.
4. Shorelands on the east side of the sub-area that are suitable for water dependent development shall be reserved for water dependent uses. On shorelands on the west side of the sub-area, low intensity natural resource uses shall be preferred.

Oysterville Sub-Area

Predominant Character

The Oysterville sub-area is rural in character, with a mixture of low intensity development and natural resource areas. The predominant development in the area is for aquaculture uses. The Oysterville sub-area is the prime aquaculture area of Yaquina Bay. The natural resource areas include tide flats, the most extensive tracts of intact tidal marsh in the estuary, eel grass and algal beds, important fish spawning and nursery areas, and major shellfish beds. Areas of important wildlife habitat occur throughout the sub-area, particularly on the south shore of the estuary. Mature native Olympia oysters have been found in this sub-area in patches on any type of hard surface, such as rock, oyster shells, pilings, and fixed woody debris or other stationary hard surface.

Major Committed Uses

The predominant use within the sub-area is aquaculture. A large share of the estuarine area outside of the navigation channel is devoted to aquaculture. The Wetlands Conservancy has a substantial ownership in the sub-area and manages these lands for conservation. Natural resources such as tidal marsh, eel grass and algal beds within the sub-area provide ecosystem service benefits to aquaculture activities. Recreational use of the sub-area (primarily boating and angling) is also extensive. Shoreland uses include landside facilities for aquaculture operations, scattered rural residences, conservation areas management, and commercial forest management activities.

Existing or Potential Conflicts

The Oysterville sub-area is relatively free of conflict. Potential conflict could develop if demand for increased recreational moorage facilities spills over from adjacent sub-areas. Such development could threaten existing and future aquaculture operations by adversely impacting water quality. The potential for ocean acidification to impact current aquaculture operations is a possible emerging issue.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Aquaculture and recreational shellfish losses due to ocean acidification that impairs the formation of oyster shells;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Increased risk of shoreline protection structures, pilings, or jetties becoming underwater hazards due to sea level rise;
- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall;
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes;
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges);
- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge;
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk of tide gates and dike failures due to sea level rise and storm surge;
- Increased risk to current dredging regime or location of navigation channels as erosion and accretion patterns change due to sea level rise and storm surge;
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise.

Sub-Area Policies

1. Maintaining suitability for aquaculture uses is the top priority in the overall management of the Oysterville sub-area due to the scarcity of such resources throughout Yaquina Bay.
2. The overall management of the Oysterville sub-area shall emphasize conservation of natural resources and maintenance of water quality. Major tracts of tidal marsh and tide flats shall be preserved.

3. The recreational resources of the sub-area should be utilized by maintaining existing patterns of use. High intensity recreational development shall not be permitted.
4. In general, low intensity land uses such as forestry, conservation management, and low density housing shall be preferred in adjacent shoreland areas, consistent with the protection of significant wildlife habitat. It is recognized that some adjacent shoreland areas will also be needed for developed aquaculture facilities.

Boone's Sub-Area

Predominant Character

The Boone's sub-area is a largely undeveloped portion of the estuary. Some minor alterations of the estuary are present, mostly in conjunction with the diking of marshlands and remnant structures formerly used for log storage. A variety of important natural resource values are associated with the sub-area, including tideflats, extensive tidal marshes, eel grass and algal beds, fish spawning and nursery areas, and shellfish beds of major importance. Mature native Olympia oysters have been found in this sub-area in patches on any type of hard surface, such as rock, oyster shells, pilings, and fixed woody debris or other stationary hard surface. Adjacent shorelands include substantial areas of important wildlife habitat.

Major Committed Uses

Major uses in the sub-area include shallow draft navigation (authorized depth of 10 feet) and recreation. Important recreational activities include boating, angling and water skiing. Shoreland uses consist primarily of dispersed rural residences, forestry, and agriculture. The Port of Toledo maintains public access recreational boating facilities within the sub-area at river mile 10.7 and at the Toledo Airport at river mile 11.1.

Existing or Potential Conflicts

There are currently no major conflicts within the sub-area. The possible expansion of the Toledo airport facility represents a potential conflict as the resulting fill that would be required would conflict with the preservation of productive tidal marsh. In Boone's and Nute's sloughs, a potential conflict exists between the possible need for the area as a restoration/mitigation site and the demand to commit the area to land uses which would preclude its use for restoration/mitigation.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Increased shoreline erosion due to changes in sediment transport and deposition patterns or increased intensity of storm surge;
- Increased demand for shoreline protective structures due to increased erosion from sea level rise and storm surge;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Increased risk of shoreline protection structures, pilings, or jetties becoming underwater hazards due to sea level rise;
- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall;
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes;
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges);
- Increased frequency and extent of storm surge flooding due to sea level rise risking the integrity and hindering the use of critical infrastructure;
- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge;
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk of tide gates and dike failures due to sea level rise and storm surge;
- Increased risk to current dredging regime or location of navigation channel as erosion and accretion patterns change due to sea level rise and storm surge;
- Increased frequency and extent of storm surge flooding due to sea level rise of bay-adjacent industrial and waste treatment sites increasing risk of structural damage and pollution event;
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise;
- Increased risk to livestock in bay adjacent pasture land due to sea level rise and storm surge.

Sub-Area Policies

1. The emphasis in the Boone's sub-area shall be to conserve and protect natural resources.

2. Establishment of new uses which would substantially degrade recreational values within the sub-area shall not be permitted.
3. Boone's and Nute's sloughs shall be protected from land uses which would preclude their potential use as a restoration or mitigation site.
4. Low intensity land uses such as forestry, agriculture and low-density housing shall be preferred in adjacent shoreland areas. Such uses shall be consistent with the protection of significant wildlife habitat.

Toledo Sub-Area

Predominant Character

The Toledo sub-area is a mix of high intensity industrial development within the Toledo urban area and undeveloped areas that are rural in character. The character of the sub-area is defined primarily by the wood products and marine construction and repair industrial uses along the urban waterfront. Natural resources of major significance include anadromous fish migration routes, wetlands, and some areas of important wildlife habitat.

Major Committed Uses

A portion of the Toledo sub-area is committed to high intensity industrial uses - primarily wood products manufacturing, along with the Port of Toledo's shipyard at Sturgeon Bend. These industrial uses are served by medium draft navigation, though commercial cargo traffic is not currently active. Recreational use in the Toledo sub-area is light.

Existing or Potential Conflicts

No major conflicts exist within the sub-area. Intensified industrial development may have adverse impacts on water quality. Demand for industrial expansion may also potentially conflict with protection of fish and wildlife habitat in the area.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Increased shoreline erosion due to changes in sediment transport and deposition patterns or increased intensity of storm surge;
- Increased demand for shoreline protective structures due to increased erosion from sea level rise and storm surge;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;

- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Increased frequency and extent of storm surge flooding due to sea level rise risking the integrity and hindering the use of critical infrastructure;
- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge;
- Increased risk of loss of structural integrity to underground or submerged infrastructure due to higher water tables from sea level rise;
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk of tide gates and dike failures due to sea level rise and storm surge;
- Increased risk of sea level rise submerging port, marina, and other moorage space infrastructure;
- Increased risk to current dredging regime or location of navigation channels as erosion and accretion patterns change due to sea level rise and storm surge;
- Increased frequency and extent of storm surge flooding due to sea level rise of bay-adjacent industrial and waste treatment sites increasing risk of structural damage and pollution event;
- Increased risk of combined sewer overflow (CSO) events due to sea level rise, riverine flooding, and changing winter precipitation patterns;
- Increased risk of toxic leaks from erosion and destabilization of submerged sewer, natural gas and other pipes and utility lines due to changes in littoral drift.

Sub-Area Policies

1. The portion of the Toledo sub-area within the Toledo Urban Growth Boundary shall be managed for continued development of water-dependent and water-related industrial uses.
2. Restoration, maintenance and expansion of existing non-water related uses shall be permitted.
3. Effects on water quality must be carefully considered in the process of industrial expansion in order to minimize adverse impacts, both within the sub-area and in areas down-river.
4. Areas of significant habitat and major marshes shall be protected.
5. If not needed for water-dependent development, the diked areas along Depoe and Olalla Sloughs should be protected as potential restoration sites.

Upper River Sub-Area

Predominant Character

The Upper River sub-area is a largely undeveloped rural environment. Navigation channel improvements are not maintained above RM 14 and overall alteration of the river above this point is minimal. While river flows are subject to tidal influence, the river environment is predominantly freshwater. Several tracts of historically diked tidal marsh have been restored in the sub-area. Shoreland areas are characterized by scattered diked marshlands, and a narrow floodplain grading into steep forested uplands.

Major Committed Uses

Major uses in adjacent shorelands of the Upper River sub-area include small scale agricultural operations, high intensity commercial forest management activities, while recreational activities (primarily boating and angling for anadromous fish) are the predominant uses within the estuary. No active commercial or industrial uses are located within the sub-area.

Existing or Potential Conflicts

No major conflicts exist within the sub-area. Some potential for conflict exists with pressures for additional river front residential development within the sub-area. Such development may precipitate demand for construction of individual docks and moorage, shoreline stabilization and other activities that may conflict with conservation of estuarine resources and established recreational uses.

Climate Vulnerabilities

The following list contains potential vulnerabilities to climate change that this sub-area of the estuary may experience over the coming years. These vulnerabilities shall be considered during reviews of proposed activities or uses in this sub-area as applicable (see Plan Part X for more details):

- Increased shoreline erosion due to changes in sediment transport and deposition patterns or increased intensity of storm surge;
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation;
- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise;
- Loss of carbon capturing (blue carbon) habitat due to sea level rise;
- Water damages to housing structures or mobile homes from riverine flooding due to sea level rise;
- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge;
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise;
- Increased risk of tide gates and dike failures due to sea level rise and storm surge;

- Increased risk of sea level rise submerging port, marina, and other moorage space infrastructure;
- Increased risk of riverine flooding of public infrastructure due to tidal amplification, sea level rise, and storm surge;
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise;
- Increased risk to livestock in bay adjacent pasture land due to sea level rise and storm surge.

Sub-Area Policies

1. The primary objective in the Upper River sub-area shall be to conserve and protect natural resources. Uses that require little or no alteration to the estuary shall be preferred.
2. Increased public recreational access to the estuary shall be encouraged.
3. Natural resource-based uses (e.g., forestry, agriculture and conservation) shall be preferred in adjacent shoreland areas.
4. The proliferation of individual single purpose docks and piers within the sub-area shall be restricted by encouraging community facilities at appropriate location.

PART IV - CLASSIFICATION SYSTEM

Proposed revisions as part of the 2023 update

In order to maintain a diversity of values and resources, the estuary has been divided into Management Units. A management unit is a discrete geographic area defined by biophysical characteristics and features within which particular uses and activities are promoted, encouraged, protected, or enhanced, and others are discouraged, restricted, or prohibited.

Each individual management unit is assigned a classification that defines a management objective, provides a general policy framework for the unit, and specifies permissible uses and alterations. The management unit classification system consists of three management classifications: Natural, Conservation and Development. The classifications are defined below in terms of the general attributes and characteristics of geographic areas falling into each category. The management objective and permissible uses and alterations for each classification are also specified.

1. Natural Management Units. Natural Management Units are those areas that are needed to ensure the protection of significant fish and wildlife habitats; of continued biological productivity within the estuary; and of scientific, research, and educational needs. These shall be managed to preserve the natural resources in recognition of dynamic, natural, geological and evolutionary processes. Such areas shall include, at a minimum, all major tracts of salt marsh, tideflats, tidal swamps, and seagrass and algal beds.

The following uses are permitted in Natural Management Units:

- a. undeveloped low-intensity water-dependent recreation;
- b. research and educational observation;
- c. navigational aids, such as beacons and buoys;
- d. protection of habitat, nutrient, fish, wildlife and aesthetic resources;
- e. passive restoration measures;
- f. dredging necessary for on-site maintenance of existing functional tidegates and associated drainage channels and bridge crossing support structures;
- g. riprap for protection of uses existing as of October 7, 1977, unique natural resources, historical and archeological values; and public facilities; and
- h. bridge crossings.

Where consistent with the resource capabilities of the area and the purpose of this management unit, the following uses may be allowed:

- a. aquaculture which does not involve dredge or fill or other estuarine alteration other than incidental dredging for harvest of benthic species or removable in-water structures such as stakes or racks;
- b. communication facilities;
- c. active restoration of fish and wildlife habitat or water quality and estuarine enhancement;
- d. boat ramps for public use where no dredging or fill for navigational access is needed;
- e. pipelines, cables and utility crossings, including incidental dredging necessary for their installation;
- f. installation of tidegates in existing functional dikes;
- g. temporary alterations;
- h. bridge crossing support structures and dredging necessary for their installation.

In Natural Management Units, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant, or the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity, and values for scientific research and education.

MANAGEMENT OBJECTIVE: To preserve, protect and where appropriate enhance these areas for the resource and support values and functions they provide.

- 2. Conservation Management Units. Conservation Management Units shall be designated for long-term uses of renewable resources that do not require major alteration of the estuary except of the purpose of restoration. These areas shall be managed to conserve their natural resources and benefits. These shall include areas needed for maintenance and enhancement of biological productivity, recreational and aesthetic uses, water quality, and aquaculture. They shall include tracts of significant habitat smaller or of less biological importance than those in (1) above, and recreational or commercial oyster and clam beds not included in (1) above. Areas that are partially altered and adjacent to existing development of moderate intensity that do not possess the resource characteristics of natural or development units shall also be included in this classification.

While the general purpose and intent of the conservation classification are as described above, uses permitted in specific areas subject to this classification may be adjusted by special policies applicable to individual management units in order to accommodate needs for natural resource preservation.

Permissible uses in conservation areas shall be all those allowed in (1) above except temporary alterations. Where consistent with the resource capabilities of the area and the purposes of this management unit, the following additional uses may be allowed:

- a. high-intensity water-dependent recreation, including boat ramps, marinas and new dredging for boat ramps and marinas;
- b. minor navigational improvements;
- c. mining and mineral extraction, including dredging necessary for mineral extraction;
- d. other water-dependent uses requiring occupation of water surface area by means other than dredge or fill;
- e. aquaculture requiring dredge or fill or other alteration of the estuary;
- f. active restoration for purposes other than those listed in 1(d);
- g. temporary alterations.

In a Conservation Management Unit, a use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner that conserves long-term renewable resources, natural biologic productivity and aesthetic values and aquaculture.

MANAGEMENT OBJECTIVE: To conserve, protect and where appropriate enhance renewable estuarine resources for long term uses and to manage for uses that do not substantially degrade the natural or recreational resources or require major alterations of the estuary.

3. Development Management Units. Development Management Units shall be designated to provide for navigation and other identified needs for public, commercial, or industrial water dependent uses, consistent with the level of development or alteration allowed by the overall Oregon Estuary Classification. Such areas shall include deep-water areas adjacent or in proximity to the shoreline, navigation channels, sub-tidal areas for in-water disposal of dredged material and areas of minimal biological significance needed for uses requiring alteration of the estuary.

While the general purpose and intent of the development classification are as described above, uses permitted in specific areas subject to this clarification may be adjusted by special policies applicable to individual management units in order to accommodate needs for natural resource preservation.

Permissible uses in areas managed for water-dependent activities shall be navigation and water-dependent commercial and industrial uses.

The following uses may also be permissible in development management units:

- a. dredge or fill, as allowed elsewhere in the plan;
- b. navigation and water-dependent commercial enterprises and activities;
- c. water transport channels where dredging may be necessary;
- d. flow-lane disposal of dredged material monitored to assure that estuarine sedimentation is consistent with the resource capabilities and purposes of affected natural and conservation management units;
- e. water storage areas where needed for products used in or resulting from industry, commerce and recreation;
- f. marinas.
- g. Where consistent with the purposes of this management unit and adjacent shorelands designated especially suited for water-dependent uses or designated for waterfront redevelopment, water-related and non-dependent, non-related uses not requiring dredge or fill; mining and mineral extraction; and activities identified in (1 - Natural) and (2-Conservation) above, shall also be appropriate.

MANAGEMENT OBJECTIVE: To provide for water dependent and water related development.

ESTUARY ZONING DISTRICTS

Information on permitted, conditional, or not allowed uses and activities can be found in the Estuary Zoning Districts for the below jurisdictions. Templates for Natural, Conservation, and Development estuary zoning districts can be found in Appendix F.

Lincoln County: [Placeholder for zoning code location]

City of Newport: [Placeholder for zoning code location]

City of Toledo: [Placeholder for zoning code location]

PART V - ESTUARINE USE STANDARDS

From original EMP document (not updated)

Estuarine Use Standards

The following standards will be applied to all new uses and activities in Lincoln County's estuaries. All estuarine uses that involve dredging, fill, structures, shoreline stabilization (except vegetative) or other alteration waterward of Mean Higher High Water or the line of non-aquatic vegetation are currently regulated either at the state level (State Removal/Fill Law, ORS 541,695), federal level (Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act) or both. Certain other uses such as energy facility siting, aquaculture, and exploration for oil, gas, or geothermal energy are further regulated by additional state or federal permits. To minimize duplication of local, state, and federal permits, the estuarine use standards will be applied through local review of the appropriate state and/or federal permits. In addition to the standards set forth herein, all uses and activities must further comply with applicable state and federal regulations governing water quality, resource protection, and public health and safety.

Structures

Definition: Structures include all constructed, man-made facilities which extend into the estuary; fixed or floating.

Structures do not include log rafts or new land created from submerged or submersible lands (see fill).

Structural types include:

Docks: A fixed or floating decked structure against which a boat may be berthed temporarily or indefinitely.

Pier: A structure extending into the water from solid land generally to afford passage for persons or goods to and from vessels, but sometimes to provide recreational access to the estuary.

Wharf: A structure built alongside a waterway for the purpose of receipt, discharge and storage of goods and merchandise from vessels.

Piling: A long, slender stake or structural element of steel, concrete or timber which is driven, jetted, or otherwise embedded into the bed of the estuary for the purpose of supporting a load.

Dolphin: A group of piles driven together and tied together so that the group is capable of withstanding lateral forces from vessels or other floating objects.

Jetty: An artificial barrier used to change littoral drift to protect inlet entrances from excessive sedimentation and to direct and confine the stream of tidal flow. Usually constructed at the mouth of a river or estuary to help deepen and stabilize a channel.

Groin: A shore protection structure (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shoreline. Generally constructed of rock or other solid material.

Pile Dike: Flow control structures analogous to groins, but constructed from closely spaced piling connected by timbers.

Breakwater: An offshore barrier, sometimes connected to the shore at one or both ends to break the force of waves. Used to protect harbors and marinas, breakwaters may be constructed of rock, concrete, piling or may be floating structures.

1. The siting and design of all structures shall be chosen to minimize adverse impacts on aquatic life and habitats, flushing and circulation characteristics and patterns of erosion and accretion.
2. Materials to be used for structures shall be clean and durable so as to allow long term stability and minimize maintenance. Materials which could create water quality problems or which will rapidly deteriorate are not permitted.
3. The development of structures shall be evaluated to determine potential conflicts with established water uses (e.g. navigation, recreation, aquaculture, etc.). Such conflicts shall be minimized to the extent feasible.
4. Occupation of estuarine surface area by structures shall be limited to the minimum area practical to accomplish the proposed use.
5. Where feasible, breakwaters of the floating type shall be preferred over those of solid construction.

6. Floating structures shall not be permitted in areas where they would regularly contact the bottom at low water (i.e. shall be located waterward of Mean Lower Low Water). Exceptions may be granted for structures of limited area which are necessary as part of an overall approved project where grounding would not have significant adverse impacts.
7. Individual single purpose docks and piers for recreational and residential uses shall be permitted only when it has been demonstrated that there are no practical alternatives (e.g. mooring buoys, dry land storage etc.). Community facilities or other structures common to several uses are encouraged at appropriate locations.
8. Piers, docks and similar facilities for individual recreational or residential uses shall meet each of the following requirements:
 - a. No dock, pier or similar facility shall extend into any watercourse more than 25' beyond MLLW unless. It can be demonstrated that additional extension is essential to accomplish the intended purpose of the structure.
 - b. No individual private recreational dock, pier or similar facility shall extend into any watercourse more than 5% of the width thereof (as measured perpendicular from MLLW on one side of the watercourse to MLLW on the opposite side) unless it can be shown that additional extension is essential to accomplish the intended purpose of the structure.
9. Docks and similar facilities shall have the long dimension running parallel to the channel unless future development will result in pier construction or moorages being connected, necessitating facility design perpendicular to the channel.

Dredging

Definition: The removal of sediment or other material from the estuary usually for the purpose of deepening a channel, mooring basin or other navigation area

1. All dredging in the estuary shall be conducted in such a manner so as to minimize:
 - a. Adverse short-term effects such as pollutant release, dissolved oxygen depletion and disturbance of important biological communities.
 - b. Adverse long-term effects such as loss of fish habitat and tidelands, loss of flushing capacity, destabilization of bottom sediments, and biologically harmful changes in circulation patterns.
 - c. Removal of material in wetland and productive shallow submerged lands.
2. Dredging shall be permitted only:
 - a. For navigation or navigational access; or

- b. In conjunction with a permitted or conditionally permitted water dependent use; or
 - c. As part of an approved restoration project; or
 - d. For mining or mineral extraction as provided for in the Mining and Mineral Extraction Standards; or
 - e. For an approved public use, such as bridge crossings, submerged utility crossings, etc.
3. Local governments shall rely on the Division of State Lands to administer the provisions of ORS Ch. 541 requiring the mitigation of adverse impacts of dredging in intertidal and tidal marsh areas.

Shoreline Stabilization

Definition: The stabilization or protection from erosion of the banks of the estuary by vegetative or structural (rip rap or bulkheads) means.

1. Shoreline stabilization procedures shall be confined to those areas where:
 - a. Active erosion is occurring which threatens existing uses or structures; or
 - b. New development or re-development of water dependent or water related uses requires protection for maintaining the integrity of upland structures or facilities.
2. The following, in order, are the preferred methods of shoreline stabilization:
 - a. Vegetative or other non-structural
 - b. Vegetated rip rap
 - c. Unvegetated rip rap
 - d. Bulkheads.

Structural shoreline stabilization methods shall be permitted only where a higher priority method is not feasible.

3. Materials to be used must be clean and of a non-erodable quality that will allow long term stability and minimize maintenance. Materials which could create water quality problems or which will rapidly deteriorate are not permitted.
4. Minor modification of the bankline profile may be permitted on a case-by-case basis. These alterations shall serve the purpose of gaining additional upland area.
5. Shoreline stabilization structures shall be designed and located so as to minimize adverse impacts on aquatic life and habitat, circulation and flushing characteristics, and patterns of erosion and accretion.

6. The use of bulkheads shall be limited to "development" and "conservation" management units.

Fill

Definition: Placement of material in the estuary to create new shoreland area.

1. Fill shall be permitted only in conjunction with a water dependent use which requires an estuarine location and for which no feasible alternatives (e.g. construction on piling) or upland locations exist.
2. All fill projects shall be designed and placed so as to minimize adverse impacts on aquatic life and habitats, flushing and circulation characteristics, erosion and accretion patterns, navigation and recreation.
3. Fill materials which could create water quality problems or which will rapidly deteriorate are not permitted.
4. When available from an authorized dredging project, dredged materials shall be preferred over upland materials for approved fill projects.
5. As an integral part of the fill process, new fills placed in the estuary shall be protected by approved methods of bank stabilization to prevent erosion.
6. Local governments shall rely on the Division of State Lands to administer the provisions of ORS Ch. 541 requiring the mitigation of adverse impacts of filling in intertidal or tidal marsh areas.
7. In the design of fill projects, provision of public access to the estuary shall be encouraged to the extent compatible with the proposed use.

Marina and Port Facilities

Definitions:

Marina: A small harbor, boat basin or moorage dockage for recreational craft.

Port Facilities: Facilities which accommodate and support commercial fishery and navigation activities, including terminals and boat basins and moorage for commercial vessels, barges and oceangoing ships.

1. All structures, fills, dredging or shoreline stabilization measures undertaken in conjunction with marina or port facility development must comply with applicable standards set forth in this plan.
2. Provision must be made in the design of marina and port facilities to ensure adequate flushing for the maintenance of water quality.
3. Open moorage shall be preferred over covered or enclosed moorage except for repair or construction facilities.
4. Multi-purpose and cooperative use of moorage, parking, cargo handling and storage facilities shall be encouraged.
5. In the development of new port marina facilities, maximum feasible public access shall be encouraged, consistent with security and safety requirements.

Aquaculture

Definition: The raising, feeding, planting and harvesting of fish, shellfish or marine plants, including facilities necessary to engage in the use.

1. All structures located in conjunction with aquaculture operations shall be subject to the standards set forth in this plan for structures.
2. Water diversion structures or man-made spawning channels shall be constructed so as to maintain minimum required stream flows for aquatic life in the adjacent streams.
3. The potential impacts of introducing a new fish or shell-fish species (or race within a species) shall be carefully evaluated in light of existing aquatic life and potential fish and shellfish production in the stream, estuary and ocean.
4. Aquaculture facilities shall be located far enough from any sanitary sewer outfalls to prevent any potential health hazard.

Mineral and Aggregate Extraction

Definition: The removal for economic use of minerals, petroleum resources, sand, gravel or other materials from the estuary.

1. All mineral and aggregate removal projects shall be conducted in such a manner so as to minimize:
 - a. Adverse short term effects such as pollutant release, dissolved oxygen depletion, excessive turbidity, and disturbance of important biological communities.
 - b. Adverse long term effects such as loss habitat and tidelands, loss of flushing capacity, destabilization of bottom sediments and biologically harmful changes in circulation patterns.
2. Removal of aggregate materials from the estuary shall be allowed only after a clear demonstration that comparable materials are not available from local upland sources.
3. Unless part of an approved fill project, spoils and stock- piles shall be placed beyond the reach of high water and in such a manner that sediment will not enter or return to the waterway.
4. Riparian vegetation shall be retained to the optimum degree possible. Disturbed shoreline areas shall be re-vegetated.

Dikes

Definition: An earthen embankment or ridge constructed to restrain high waters. New diking is placement of dikes on area which (1) has never been previously diked; or (2) has previously been diked but all or a substantial part of the area is presently subject to tidal inundation and tidal marsh has been re-established.

1. Existing functional dikes and tide gates may be maintained and repaired as necessary to fulfill their original purpose.
2. New dikes or expanded dikes in estuarine areas shall be allowed only:
 - a. As part of an approved fill project; subject to the standards for fill; and
 - b. If appropriate mitigation is undertaken in accordance with relevant state standards.
3. Dikes constructed to retain fill materials shall be considered fill and are subject to standards for fill.
4. The outside face of new dikes shall be protected by approved shoreline stabilization procedures.

Outfalls

Definition: An outlet through which materials are discharged into the estuary. Outfalls include sanitary (sewer) discharges, storm drainage facilities and industrial waste discharges.

1. As applicable, the standards for dredging, shoreline stabilization and placement of structures as set forth in this plan must be complied with in the installation of outfalls.
2. Outfalls shall not be allowed in poorly flushed areas of the estuary, unless all state and federal water quality standards can be met.

Submerged Crossings

Definition: Power, telephone, water, sewer, gas or other transmission lines which are constructed across the estuary, usually by embedding into the bottom of the estuary.

1. Trenching or other bottom disturbance undertaken in conjunction with installation of a submerged crossing shall conform to the standards for dredging as set forth in this plan.
2. Submerged crossing shall be designed and located so as to eliminate interference with present or future navigational activities.
3. Submerged crossings shall be designed and located so as to ensure sufficient burial or water depth to avoid damage to the crossing.

Restoration

Definition: Replacing or restoring original attributes or amenities such as natural biological productivity or cultural and aesthetic resources which have been diminished or lost by past alterations or activities. Active restoration involves the use of specific remedial action such as removing dikes, installing water treatment facilities, etc. Passive restoration is the use of natural processes, sequences or timing to bring about restoration after the removal or reduction of adverse stresses.

1. Restoration in areas designated for development shall be undertaken only if it is likely that the project will not conflict with or be destroyed by existing or subsequent development.
2. All restoration projects shall be designed so as to minimize adverse impacts on aquatic life and habitats, flushing and circulation characteristics, erosion and accretion patterns, navigation and recreation.

Excavation

Definition: Excavation of shorelands to create new estuarine surface area directly connected to other estuarine waters.

1. Creation of new estuarine surface area shall be allowed only for navigation, other water dependent use, or restoration.
2. All excavation projects shall be designed and located so as to minimize adverse impacts on aquatic life and habitats, flushing and circulation characteristics, erosion and accretion patterns, navigation and recreation.
3. Excavation of as much as is practical of the new water body shall be completed before it is connected to the estuary.
4. In the design of excavation projects, provision of public access to the estuary shall be encouraged to the extent compatible with the proposed use.

Dredged Material Disposal

Definition: The deposition of dredged material in estuarine areas or shorelands.

1. Disposal of dredged materials should occur on the smallest possible land area in order to minimize the quantity of land that is disturbed. Clearing of land should occur in stages on an as needed basis.
2. Dikes surrounding disposal sites shall be well constructed and large enough to encourage proper "ponding" and to prevent the return of suspended sediments into the estuary.
3. The timing of disposal activities shall be coordinated with the Department of Environmental Quality and the Department of Fish and Wildlife to ensure adequate protection of biologically important elements such as fish runs, spawning activity, etc. In general, disposal should occur during periods of adequate river flow to aid flushing of suspended sediments.
4. Disposal sites which will receive materials with toxic characteristics shall be designed to include secondary cells in order to achieve good quality effluent. Discharge from the sites should be monitored to ensure adequate cell structures have been constructed and are functioning properly.

5. Revegetation or other stabilization of disposal sites shall occur as soon as is practicable in order to stabilize the site and retard wind erosion.
6. Outfalls from dredged material disposal sites shall be located and designed so as to minimize adverse impacts on aquatic life and habitats and water quality.
7. General priorities for dredged material disposal sites shall be (in order of preference):
 - a. Upland or approved fill project sites
 - b. Approved offshore disposal sites
 - c. Aquatic areas

The Lincoln County Dredge Material Disposal Plan should be consulted for information concerning specific disposal sites and further policy recommendations.

Water Handling of Logs

Definition: Water handling of logs is the combined process of log dumping, storage, transportation, mill-side handling and takeout as logs are placed into the water and moved to a final processing site.

1. Water handling of logs shall be conducted in such a manner to ensure that violations of water quality standards do not result from such activities.
2. New free fall log dumps shall not be permitted. All new log dumps and shipside unloading shall employ easy let-down devices.
3. The inventory of logs in the estuary for any purpose shall be the lowest practical number for the shortest practical time considering log availability and market conditions.
4. The inventory of logs in areas where grounding will occur shall be the lowest practical number for the shortest practical time considering log availability, market conditions.
5. Best practical bark and wood debris control, collection and disposal methods shall be employed at log dumps, shipside unloading areas, raft building areas and millside handling and takeout areas.

PART VI - MANAGEMENT UNITS

Proposed revisions as part of the 2023 update

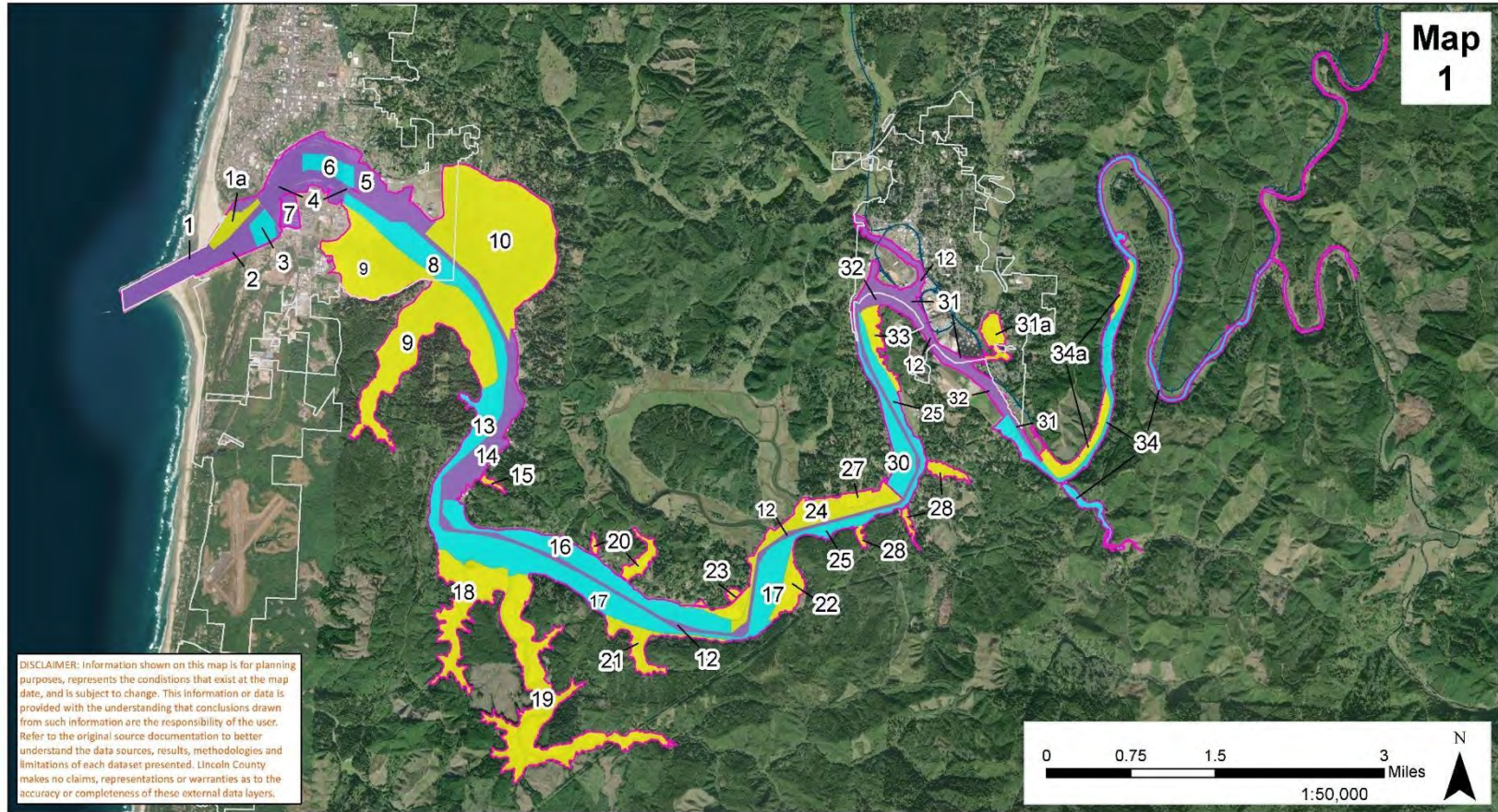
Part VI establishes the third and most specific policy level of the Lincoln County Estuary Management Plan: the individual management unit delineations and classifications.

Each management unit description includes:

- the management classification (natural, conservation or development) of the unit and a summary rationale for the classification;
- a description of the spatial boundaries of the unit;
- a summary of the natural resource characteristics of the unit;
- a description of major uses and alterations present in the unit;
- a management objective which provides an overall statement of priorities for management of the unit;
- permitted uses within the unit, both those that are deemed consistent with the resource capability of the unit, and those uses that will require case-by-case resource capability determinations;
- Special policies specific to the unit which serve to clarify, or in some cases further limit, the nature and extent of permitted uses.

During the original planning process to develop the 1982 Lincoln County Estuary Management Plan multiple management units were initially drafted but were ultimately absorbed into other adjacent units. This is the reason why management units 11, 26, and 29 have been omitted from the 1982 Plan and the 2023 update.

Figure 5 shows the spatial extent of the management units for the Yaquina Bay estuary along with their classifications. It is important to note that the text descriptions are the regulating boundary of the management units. Maps and GIS data layers are a representation of those boundaries. In case of any doubt, the text descriptions should be used to resolve any boundary confusion.



Estuary Management Unit Classifications

This map is a draft interim product of the Yaquina Bay Estuary Management Plan Update process intended to inform decision-making. This map is not the finalized product.

Date: 6/7/2023, Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
Data Source: Lincoln County, "YEMP_MUs", (2023)

Figure 5. All Estuary Management Units for Yaquina Bay

Management Unit 1: YAQUINA BAY

Description

Management Unit 1 consists of the area between the navigation channel and the north jetty west of the Highway 101 bridge, excepting the area described as Management Unit 1A (see Figure 6). Natural resources of importance include shellfish beds, fish spawning and nursery areas, and wildlife habitat. Of special importance are areas used by ling cod for spawning. Primary uses in the area are medium and shallow draft navigation and recreation (angling, boating, diving and surfing). Alterations include the north jetty, riprapped shoreline east of the jetty, navigation aids, and piling dolphins at the base of the bridge columns. (See maps for location of resources and uses)

Classification: Development

This unit has been classified as Development in order to provide for maintenance and repair of the north jetty, a navigation improvement that may require periodic major alterations. Other than providing for alterations necessary to maintain navigation, management of Unit 1 shall conserve the natural resources of the unit while allowing minor alterations similar to those now existing in the unit.

Resource Capability

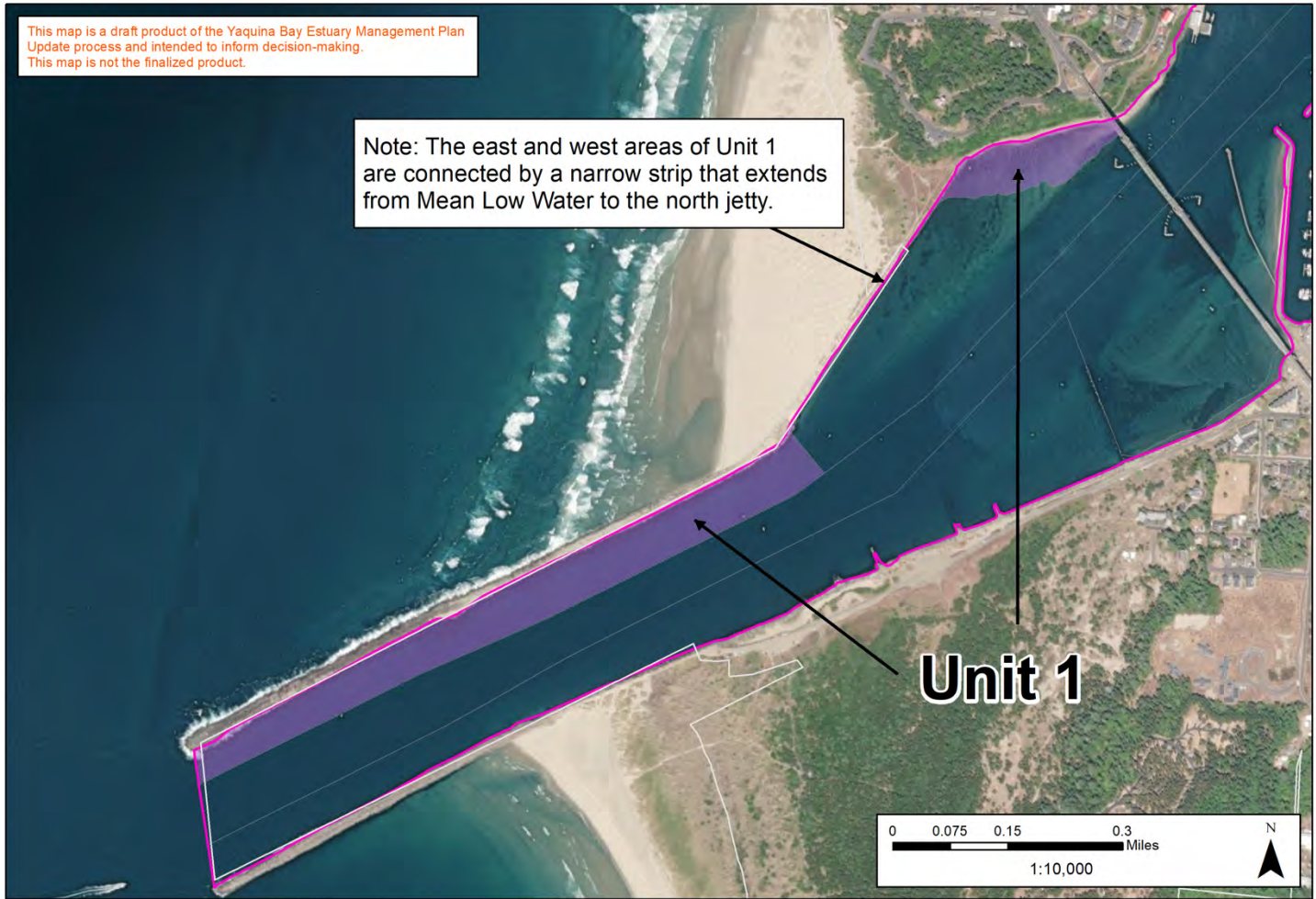
As a development management unit, permissible uses in Management Unit 1 are not subject to the resource capability test.

Management Objective

Management Unit 1 shall be managed to provide for maintenance and repair of the north jetty as necessary to maintain the functionality of the deep-water channel. Otherwise, this unit shall be managed to conserve shellfish beds, fish spawning and nursery areas, and other natural resources.

Special Policies

1. Major alterations in Management Unit 1 shall be limited to jetty and other navigation improvements necessary to maintain the authorized federal navigation channel. However, uses shall minimize disturbance of important natural resources identified in this unit.



Estuary Management Unit: 1

Date: 8/25/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 6. Estuary Management Unit 1, Yaquina Bay

Management Unit 1a: YAQUINA BAY

Description

Management Unit 1a consists of the intertidal and subtidal area west of the Yaquina Bay Bridge, lying between the navigation channel and the north shore. Along the north jetty, Unit 1a extends up to MLW (Mean Low Water). Unit 1a is bounded on the west by MLLW, and on the east by the Yaquina Bay bridge (see Figure 7). Natural resources of importance include shellfish beds, fish spawning and nursery areas, and wildlife habitat. Of special importance is a major algal bed. Primary uses in the area are medium and shallow draft navigation and recreation (angling, boating, diving and surfing). Alterations include the riprapped shoreline east of the jetty, navigation aids, and piling dolphins at the base of the bridge column. (See maps for location of resources and uses)

Classification: Natural

This unit has been classified as Natural in order to protect the natural resources of the unit and limit alterations to low intensity activities similar to those now existing in the unit.

Resource Capability

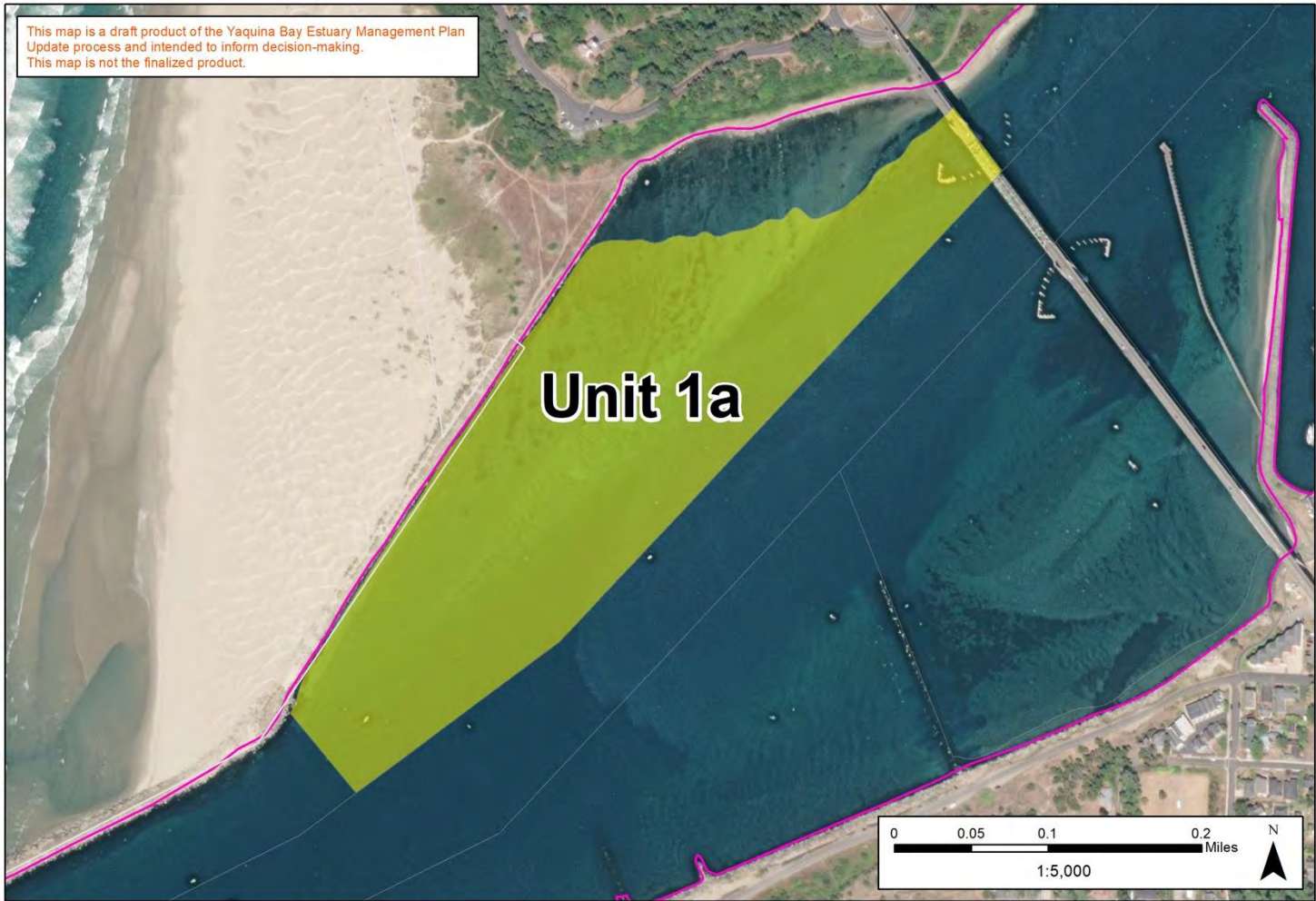
The major algal bed in this unit is a sensitive habitat area of special value. Other habitats, while of major importance, are less susceptible to disturbance from minor alterations. Low intensity alterations such as pilings, dolphins and riprap have occurred in this area in the past without significant damage to resource values. Similar activities of this nature in conjunction with the uses contemplated in Unit 1a will constitute minor alterations consistent with the resource capabilities of the area.

Management Objective

Management Unit 1a shall be managed to preserve natural resources.

Special Policies

1. The algal bed within Management Unit 1A as defined by the Oregon Department of Fish and Wildlife Habitat Classification Map shall be preserved.



Estuary Management Unit: 1a

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 7. Estuary Management Unit 1A, Yaquina Bay

Management Unit 2: YAQUINA BAY

Description

Management Unit 2 contains the area between the south jetty and the navigation channel, extending from the channel entrance east to the spur jetty (see Figure 8). From the spur jetty east to the Yaquina Bay Bridge, Unit 2 includes the aquatic area above MLW. Natural resources of importance include shellfish beds, algal beds, eel grass beds, fish spawning and nursery areas and waterfowl habitat. Major uses in the unit are shallow draft navigation and recreational activities, including fishing, diving and boating. Alterations in the area include the south jetty, the spur jetty and groins, and navigation aids. (See maps for location of resources and uses)

Classification: Development

This unit has been classified as Development in order to provide for the maintenance and reconstruction of navigation improvements, including the south jetty and the spur jetty and groins, which may require major alterations.

Resource Capability

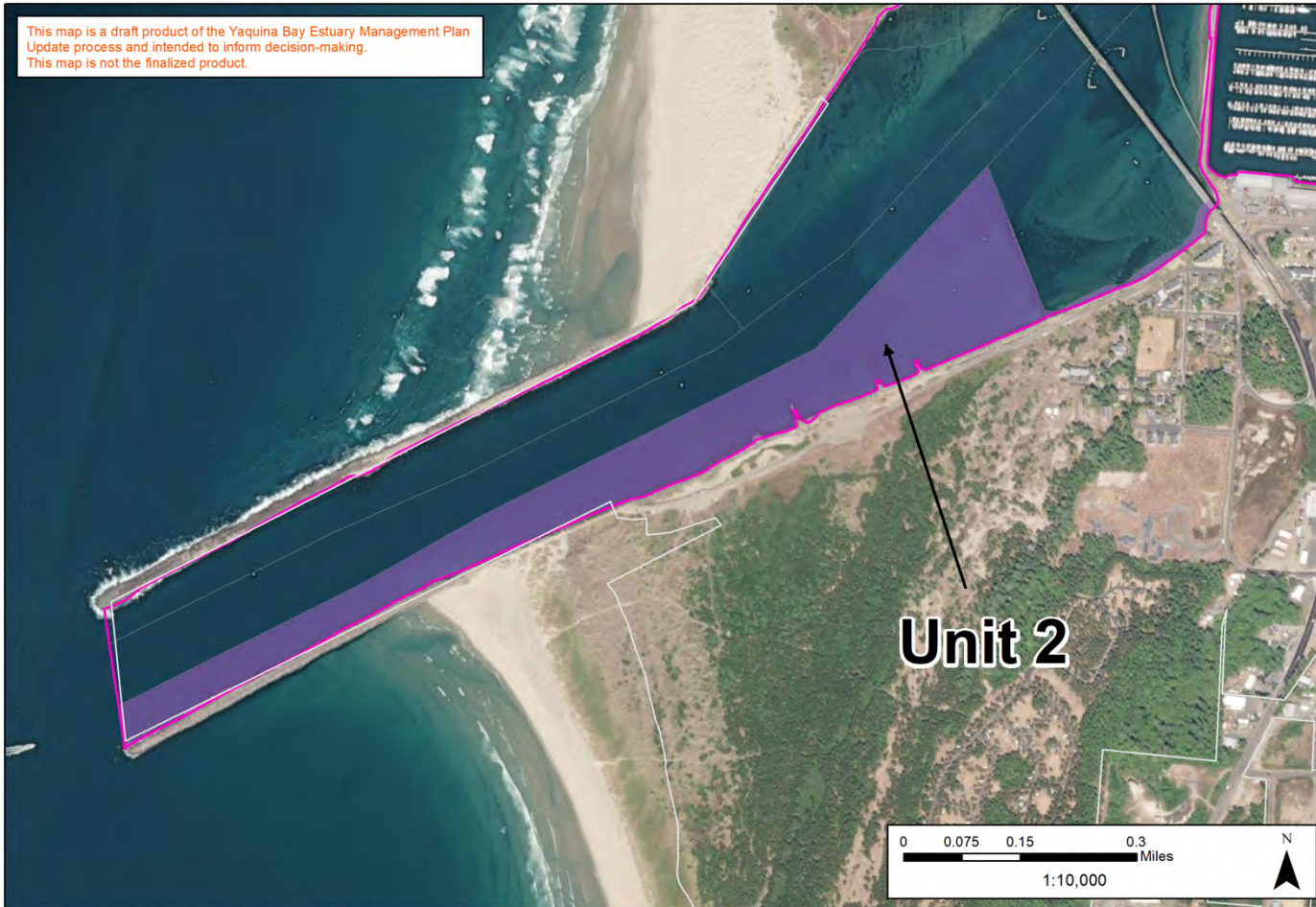
As a development management unit, permissible uses in Management Unit 2 are not subject to the resource capability test. However, uses shall minimize disturbance of important natural resources identified in this unit.

Management Objective

Management Unit 2 shall be managed to provide for the maintenance and repair of the south jetty and associated navigation improvements. Major alterations shall be limited to those necessary to provide for these uses. Otherwise, this unit shall be managed to conserve shellfish beds, algal beds, fish spawning and nursery areas and other natural resources.

Special Policies

1. Major alterations in Management Unit 2 shall be limited to jetty, groin and other navigation improvements necessary to maintain the functionality of the authorized federal navigation channel. However, uses shall minimize disturbance of important natural resources identified in this unit.



Estuary Management Unit: 2

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

 Natural Units	 Estuary Boundary
 Conservation Units	 City Limits
 Development Units	+ Railroad

Figure 8. Estuary Management Unit 2, Yaquina Bay

Management Unit 3: YAQUINA BAY

Description

Management Unit 3 consists of the area from the navigation channel to MLW along the south shore, from the spur jetty to the Yaquina Bay Bridge (see Figure 9). The area has a number of important natural resources, including tideflats, eelgrass beds, significant shellfish beds, important fish spawning and nursery areas, and important waterfowl habitat. Major uses within the unit are shallow draft navigation and recreation (clam digging, fishing, boating). Some minor commercial shellfish harvest takes place in the unit. Alterations include navigation aids, dolphins, and ripped shorelines. (See maps for location of resources and uses.)

Classification: Conservation

This unit has been classified as conservation in order to conserve the natural resources of the unit while allowing minor alterations similar to those now existing in the unit.

Resource Capability

Management Unit 3 has significant intertidal area, and important shellfish beds. Existing alterations are minor in nature. Further minor structural alterations such as pilings and dolphins would be consistent with the existing character and resource capability of the area.

Management Objective

Management Unit 3 shall be managed to conserve natural resources of importance.

Special Policies

1. Major clam beds are located within Management Unit 3. These clam beds shall be protected.



Estuary Management Unit: 3

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 9. Estuary Management Unit 3, Yaquina Bay

Management Unit 4: YAQUINA BAY

Description

Management Unit 4 is the Corps of Engineers authorized deep-water federal navigation channel, up to and including the turning basin at McLean Point. This unit includes the 40-foot-deep, 400-foot-wide entrance channel; the 30-foot-deep, 300-foot-wide bay channel, and the turning basin (see Figure 10). Natural resources within the unit include fish spawning and nursery areas, and important shellfish beds. Major uses within the unit include navigation (shallow, medium and deep draft), recreation (fishing, crabbing, and boating) and some limited commercial harvest. Alterations include pilings, navigation aids, submerged crossings and the Yaquina Bay bridge crossing. Of special importance is the maintenance dredging of the federally authorized navigation channel and turning basin. (See maps for locations of resources and uses.) Management Unit 4 is an area of diverse marine influenced habitats, including some major shellfish beds.

Classification: Development

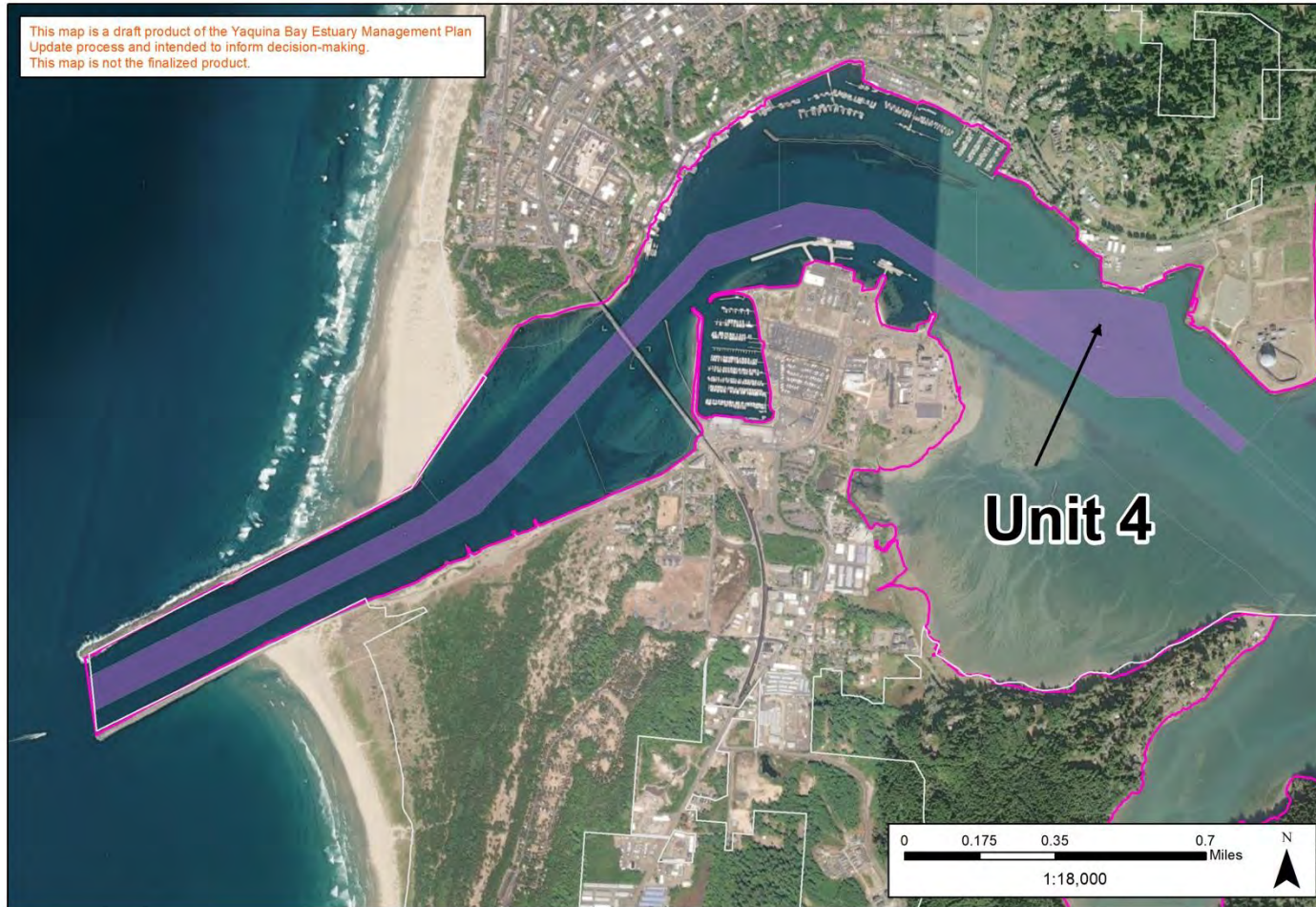
This unit has been classified as development, to provide for the dredging and other alterations required to maintain the deep-water navigation channel and turning basin.

Resource Capability

As a development management unit, authorized uses are not subject to resource capability requirements. The area is periodically dredged for maintenance of the federally authorized navigation channel and turning basin, and resources present are subject to this regular disturbance.

Management Objective

Management Unit 4 shall be managed to protect and maintain the authorized navigation channel and turning basin for deep-draft navigation.



Estuary Management Unit: 4

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend	
 Natural Units	 Estuary Boundary
 Conservation Units	 City Limits
 Development Units	 Railroad

Figure 10. Estuary Management Unit 4, Yaquina Bay

Management Unit 5: YAQUINA BAY

Description

Management Unit 5 consists of the area between the north shore of the bay and the navigation channel, from the west side of the Yaquina Bay bridge up to McLean Point (see Figure 11). It includes the Port of Newport commercial moorage basins (Port Docks 3, 5 and 7, and the north marina breakwater), the developed waterfront in the Newport urban area, and the Port of Newport's international terminal facilities at McLean Point. Natural resources of importance include tideflats, eelgrass and shellfish beds, and fish spawning and nursery areas. This portion of the estuary is used intensively for shallow and medium draft navigation, moorage of small and large boats, and for recreation. Other significant uses include the Port of Newport's international terminal operation, research activities, the U.S. Coast Guard Station, seafood processing plants and infrastructure, and mixed-use development along the historic Newport bayfront. The shoreline and aquatic areas are extensively altered with riprap, bulkheads, piers and wharves, the north marina breakwater, pilings, floating docks, periodic maintenance dredging and other activities. (See maps for location of resources and uses.)

Classification: Development

This unit is classified as development to provide for the port's development needs in support of navigation, commercial fishing and other water dependent and mixed uses along the urban waterfront.

Resource Capability

Management Unit 5 is the most extensively altered area in the estuary. Maintenance and redevelopment of existing facilities in this area, along with new development, will result in further alterations, including major dredging and construction activities. As a development management unit, these authorized uses within Management Unit 5 are not subject to resource capability requirements.

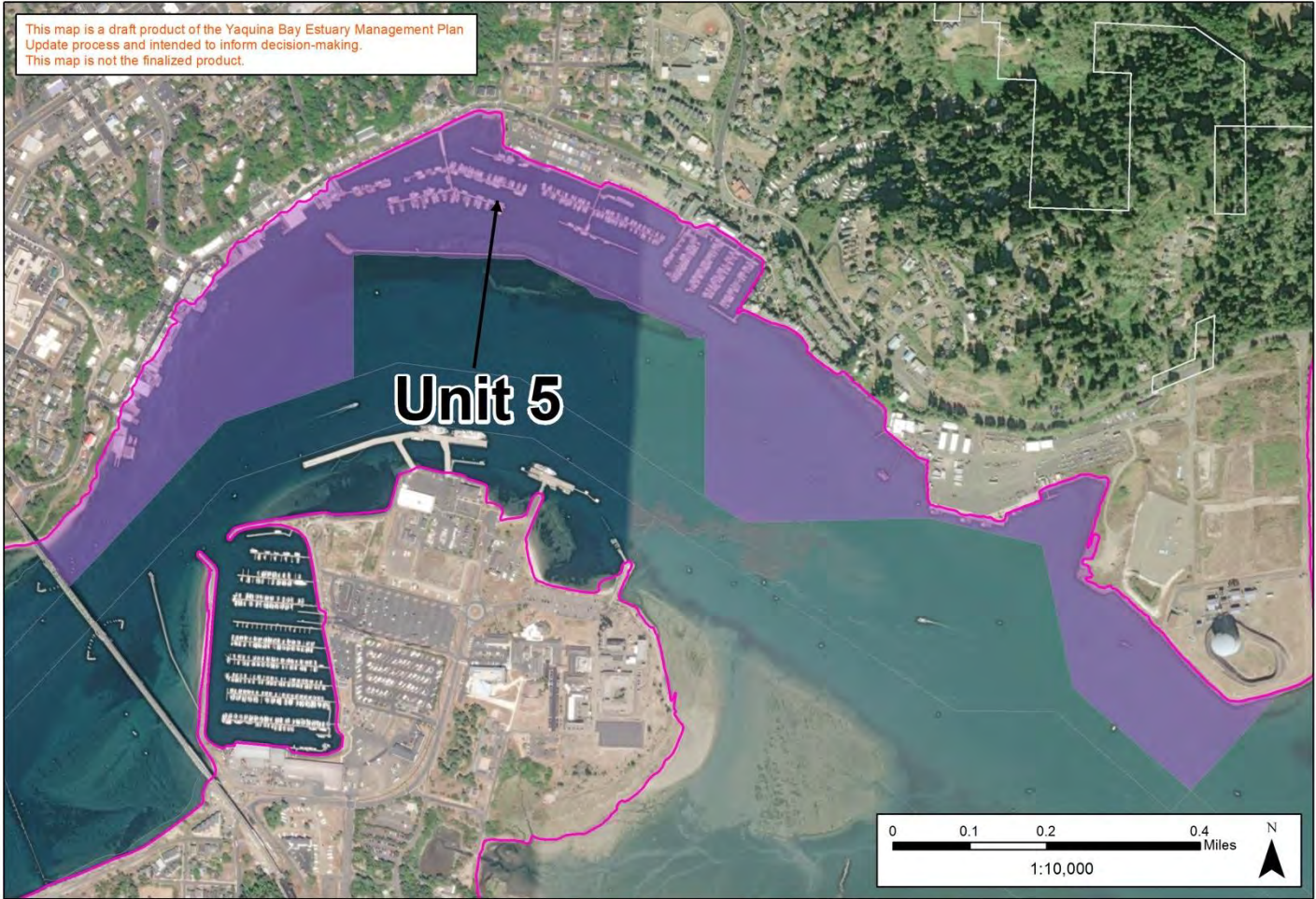
Management Objective

Management Unit 5 shall be managed to provide for the development of port facilities and other water-dependent uses requiring aquatic area alterations. Water related and non-related uses not requiring dredge or fill may be permitted consistent with the unique mixed-use character of the Newport waterfront.

Special Policies

1. Important shellfish beds are located in Management Unit 5. Adverse impacts on these shellfish beds from development shall be avoided or minimized.

2. Due to the limited water surface area available and the need for direct land to water access, alternatives (such as mooring buoys or dry land storage) to docks and piers for commercial and industrial uses are not feasible in Unit 5. Multiple use facilities common to several users are encouraged where practical.



Estuary Management Unit: 5

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- Legend**
- Natural Units
 - Conservation Units
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Figure 11. Estuary Management Unit 5, Yaquina Bay

Management Unit 6: YAQUINA BAY

Description

Management Unit 6 consists of the area south of the north marina breakwater, extending from MLW south to the navigation channel (see Figure 12). Unit 6 is bounded on the west by a north-south line extending from the west end of the breakwater to the navigation channel, and on the east by a north-south line extending from the east end of the breakwater to the navigation channel. Unit 6 contains both intertidal and subtidal area with a number of important resource characteristics. Significant habitat areas include eelgrass and shellfish beds, fish spawning and nursery areas, and waterfowl habitat. Major uses in the unit include recreation (fishing, boating, crabbing and clamming), medium and shallow draft navigation, and some limited commercial harvest activities. Alterations within the unit include pilings and navigation aids. (See maps for location of resources and uses.)

Classification: Conservation

This unit has been classified as conservation in order to conserve the natural resources of the unit while allowing minor alterations similar to those now existing in the unit.

Resource Capability

Management Unit 6 is a mostly sub-tidal area near the upper end of the marine subsystem. It supports a variety of important resources that could be adversely impacted by major fill, removal or other aquatic alterations. Important uses in the unit such as navigation and recreation require a largely unobstructed surface area. For these reasons, alterations consistent with the resource capability of this unit are limited to minor structural alterations such as pilings and dolphins. Any fill or removal activities should be evaluated on a case-by-case basis.

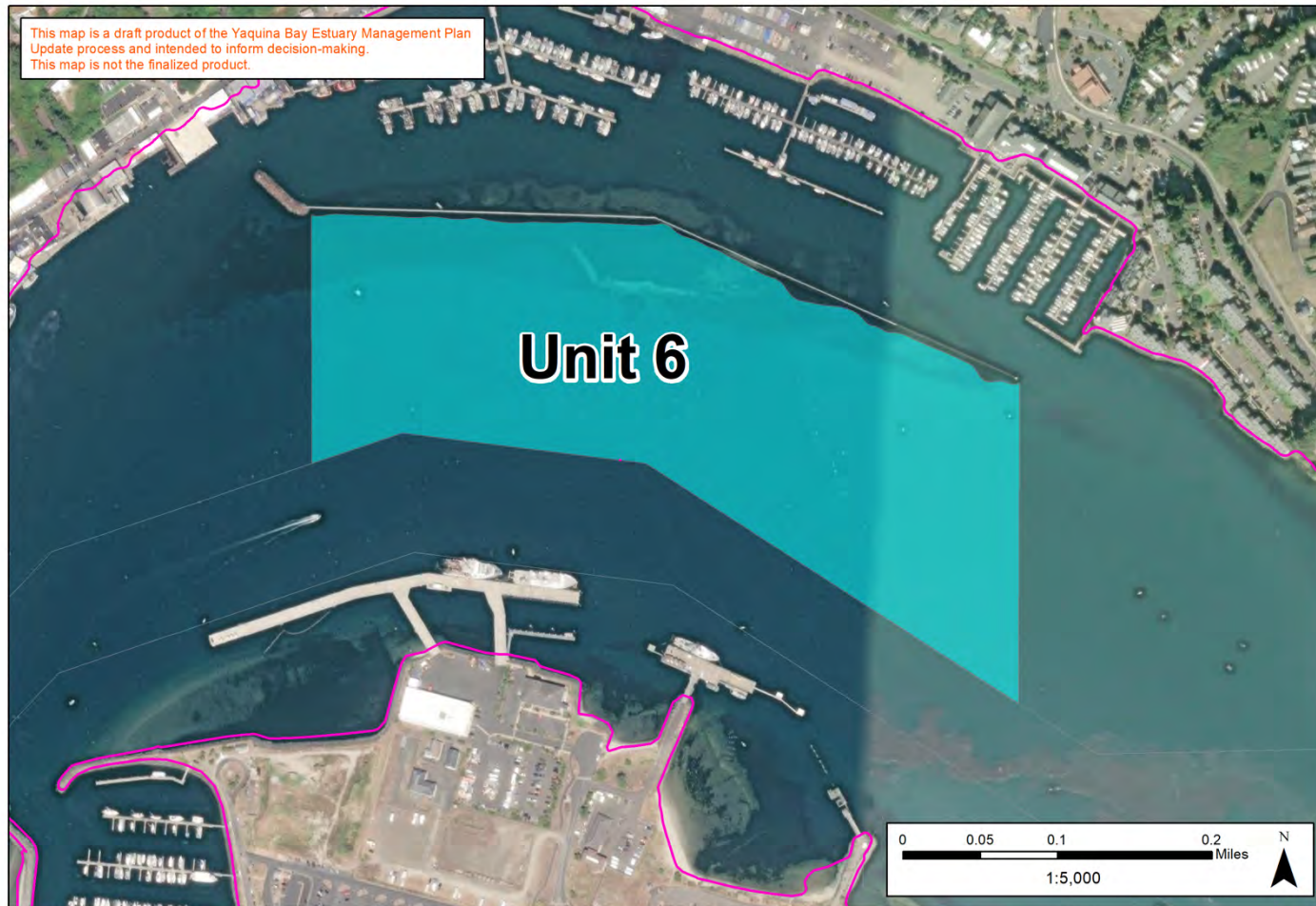
Management Objective

Management Unit 6 shall be managed to conserve natural resources and to provide for uses compatible with existing navigation and recreation activities.

Special Policies

1. The shellfish beds adjacent to the north marina breakwater as defined by the publication "Sub-tidal Clam Populations: Distribution, Abundance and Ecology" (OSU Sea Grant, May 1979) are considered a resource of major importance. Adverse impacts on this resource shall be avoided or minimized.⁹

⁹ Hancock et al. 1979. Subtidal Clam Populations: Distribution, Abundance, and Ecology. Oregon State University Sea Grant College Program. Publication no. ORESU-T-79-002.



Estuary Management Unit: 6

Date: 8/24/2023.
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- Legend**
- Natural Units
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 - City Limits
 - Railroad

Figure 12. Estuary Management Unit 6, Yaquina Bay

Management Unit 7: YAQUINA BAY

Description

Management Unit 7 consists of the aquatic area between the navigation channel and the south shore, from the Highway 101 bridge east to the small boat pier at the Hatfield Marine Science Center (see Figure 13). It includes the South Beach Marina, the NOAA Marine Operations Center, and the OSU Hatfield Marine Science Center facilities. The majority of the unit is sub-tidal and includes eelgrass and shellfish beds, and fish spawning and nursery areas. Major uses in the area are deep, medium and shallow draft navigation, moorage, recreation and some limited commercial harvest. Alterations include pilings, piers and wharves, breakwaters, floating docks, riprap, and periodic dredging. (See maps for location of resources and uses.)

Classification: Development

This unit has been classified as development to provide for water dependent uses, including the NOAA Marine Operations Center, the South Beach Marina and OSU Hatfield Marine Science Center facilities.

Resource Capability

Management Unit 7 is classified for development, therefore authorized uses are not subject to resource capability requirements.

Management Objective

Management Unit 7 shall be managed to provide for water dependent development compatible with existing uses. Non-water dependent uses not requiring dredge or fill may be permitted consistent with adjacent coastal shorelands designations.

Special Policies

1. Eelgrass beds, shellfish beds, and fish spawning and nursery areas are located within Management Unit 7. Adverse impacts of development on these resources shall be avoided or minimized.
2. Due to the limited water surface area available and the need for direct land to water access, alternatives (such as buoys and dry land storage) to docks and piers for commercial and industrial uses are not feasible in Unit 7. Multiple use facilities common to several users are encouraged where practical.



Estuary Management Unit: 7

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- Legend**
- Natural Units
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Figure 13. Estuary Management Unit 7, Yaquina Bay

Management Unit 8: YAQUINA BAY

Description

Management Unit 8 is a sub-tidal area between the navigation channel and the intertidal flats of the Idaho Point/King's Slough area (see Figure 14). It contains significant habitat areas, including eelgrass and shellfish beds, fish spawning and nursery areas, and waterfowl habitat. Uses within the unit consist of medium and shallow draft navigation, commercial harvest and recreation. Existing alterations are limited to navigation aids. (See maps for location of resources and uses.)

Classification: Conservation

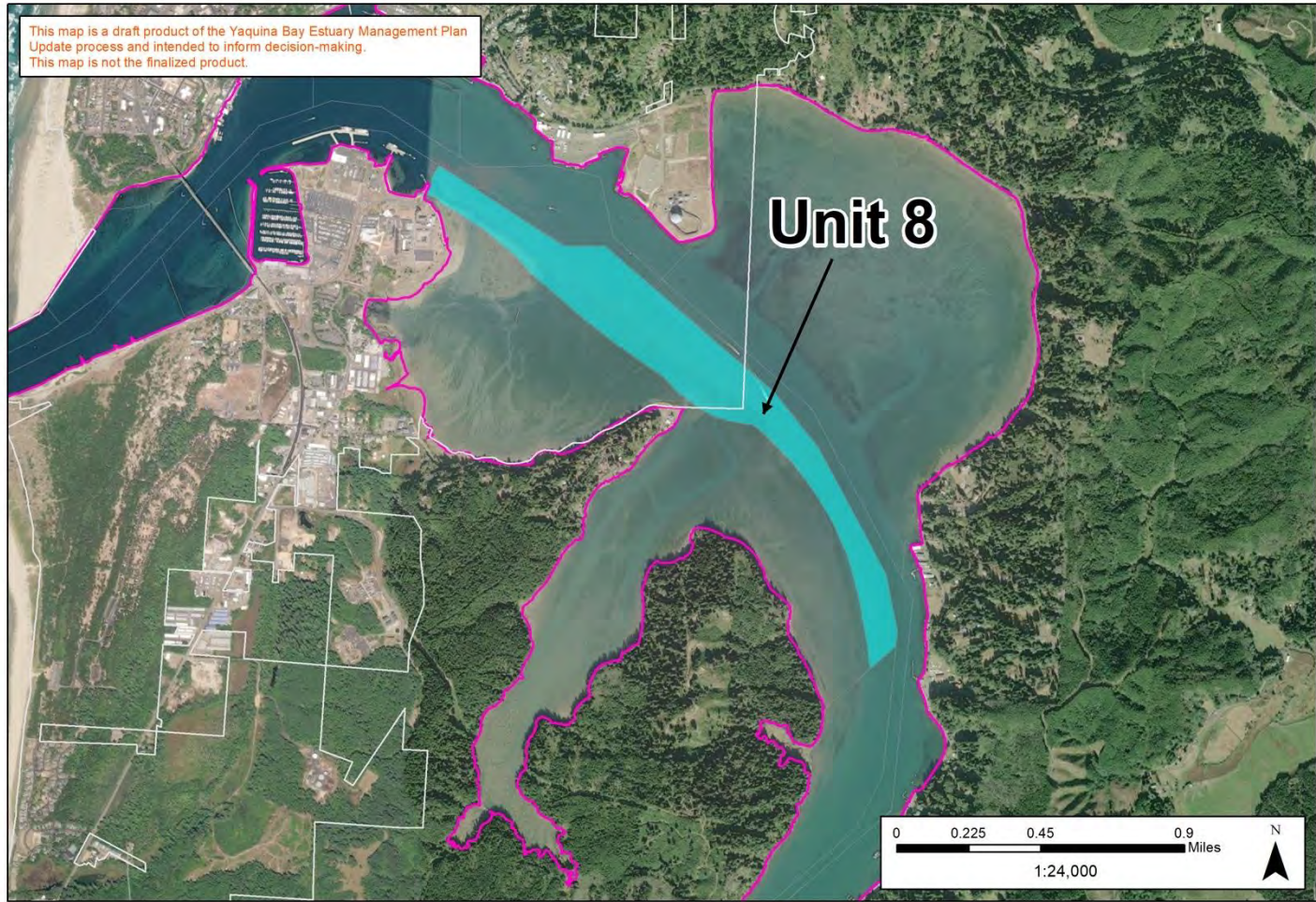
This unit has been classified as conservation in order to conserve the natural resources of the unit while allowing minor alterations similar to those now existing in the unit.

Resource Capability

Management Unit 8 is an important resource area. Shallow portions of this sub-tidal unit support eelgrass beds; major shellfish beds are also located in this area. Alterations in this area are limited to navigation aids (pile supported). Similar minor structural alterations such as pilings and dolphins are consistent with the resource capabilities of this area.

Management Objective

Management Unit 8 shall be managed to conserve and protect natural resources such as eelgrass and shellfish beds.



Estuary Management Unit: 8

Date: 8/24/2023.
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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
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- Railroad

Figure 14. Estuary Management Unit 8, Yaquina Bay

Management Unit 9: YAQUINA BAY

Description

Management Unit 9 includes the Idaho Flats tideflat between the Marine Science Center and Idaho Point, all of King Slough, and the intertidal area upriver from the mouth of King Slough known as Racoon Flat (see Figure 15). This is one of the largest tideflats in the estuary with a number of natural resource values of major significance, including eelgrass beds, shellfish beds, low salt marsh, fish spawning and nursery areas and waterfowl habitat. The area is used extensively for recreational purposes, primarily angling, clamming and waterfowl hunting. A private boat ramp (formerly the site off a small marina) is present at Idaho Point. The intertidal flat area west of Idaho Point is in public ownership (State of Oregon Board of Higher Education). Most of the intertidal area of King Slough is privately owned and was used historically for log storage. There is a small, low intensity aquaculture operation (tipping bag oyster culture) on the east side of King slough. A substantial portion of the Racoon Flat intertidal area along the west shore above the mouth of King Slough is owned by the Yakona Nature Preserve and Learning Center. Alteration to the unit is minimal, with a few scattered pilings and limited areas of ripped shoreline.

Classification: Natural

As a major tract of tideflat, this unit has been classified natural in order to preserve the natural resources of the unit.

Resource Capability

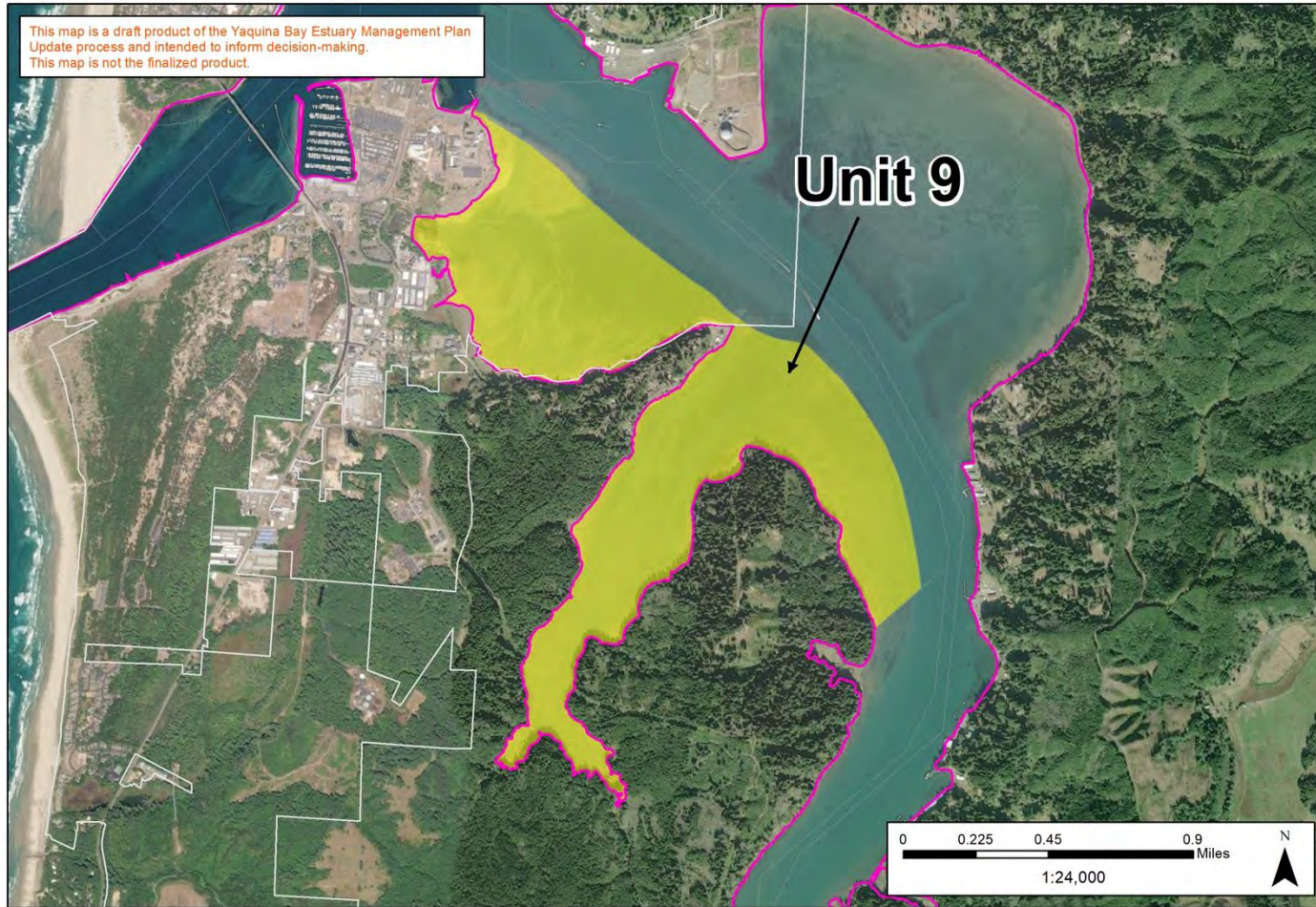
Management Unit 9 is a highly sensitive area with resource values of major importance to the estuarine ecosystem. In order to maintain resource values, alterations in this unit shall be kept to a minimum. Minor alterations which result in temporary disturbances (e.g., limited dredging for submerged crossings) are consistent with resource values in this area; other more permanent alterations will be reviewed individually.

Management Objective

Management Unit 9 shall be managed to preserve and protect natural resources and values.

Special Policies

1. Limited maintenance dredging and other maintenance activities may be permitted for the maintenance of the existing boat ramp in Management Unit 9. Expansion of this use or establishment of new marina uses is not permitted.
2. Major portions of Management Unit 9 are held in private ownership. Because the preservation of critical natural resources requires that uses in this area be severely restricted, public or conservation acquisition of these privately owned lands is strongly encouraged.



Estuary Management Unit: 9

Date: 8/24/2023,
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- Legend**
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Figure 15. Estuary Management Unit 9, Yaquina Bay

Management Unit 10: YAQUINA BAY

Description

Management Unit 10 includes the Sally's Bend area between Coquille Point and McLean Point and bounded on the south by the authorized federal navigation channel (see Figure 16). Much of this unit is owned by the Port of Newport. A number of minor alterations are present, including pilings and riprap along the shoreline.

The unit consists of one of the largest tideflats in the estuary, with a number of natural resource values of major significance including eelgrass beds, shellfish and algal beds, fish spawning and nursery areas, and wildlife and waterfowl habitat. The historically large eelgrass meadow present in MU 10 has become much smaller over time, indicating a significant loss of habitat. Eelgrass and associated habitat make this area extremely important for Endangered Species Act (ESA) listed fish species, commercially important fisheries species, recreationally important clams, and migratory birds. It is recognized as "Essential Fish Habitat" under the Magnuson–Stevens Fishery Conservation and Management Act. Additionally, a significant area in the middle of MU 10 is utilized by pinnipeds (seals and sea lions) as a haul out region, which are species supported under the Marine Mammal Protection Act. Recovering populations of native Olympia oysters have also been surveyed at the South corner of the management unit off Coquille Point.

Uses in the area are limited to shallow draft navigation, recreational use, and some minor commercial harvest of clams. The Sally's Bend recreational clamming area in this unit is the largest in Yaquina Bay. There are no public boat launches or other recreational infrastructure to access the water via boat, but public access is available at the NW Natural Gas plant on the West side and Coquille Point to the East. An Olympia oyster restoration project was initiated by ODFW in 2021, on the state-owned tidelands region of MU 10 (on the southern corner).

Classification: Natural

As a major tract of tideflat with eelgrass beds, this unit has been classified natural in order to preserve natural resources in the unit.

Resource Capability

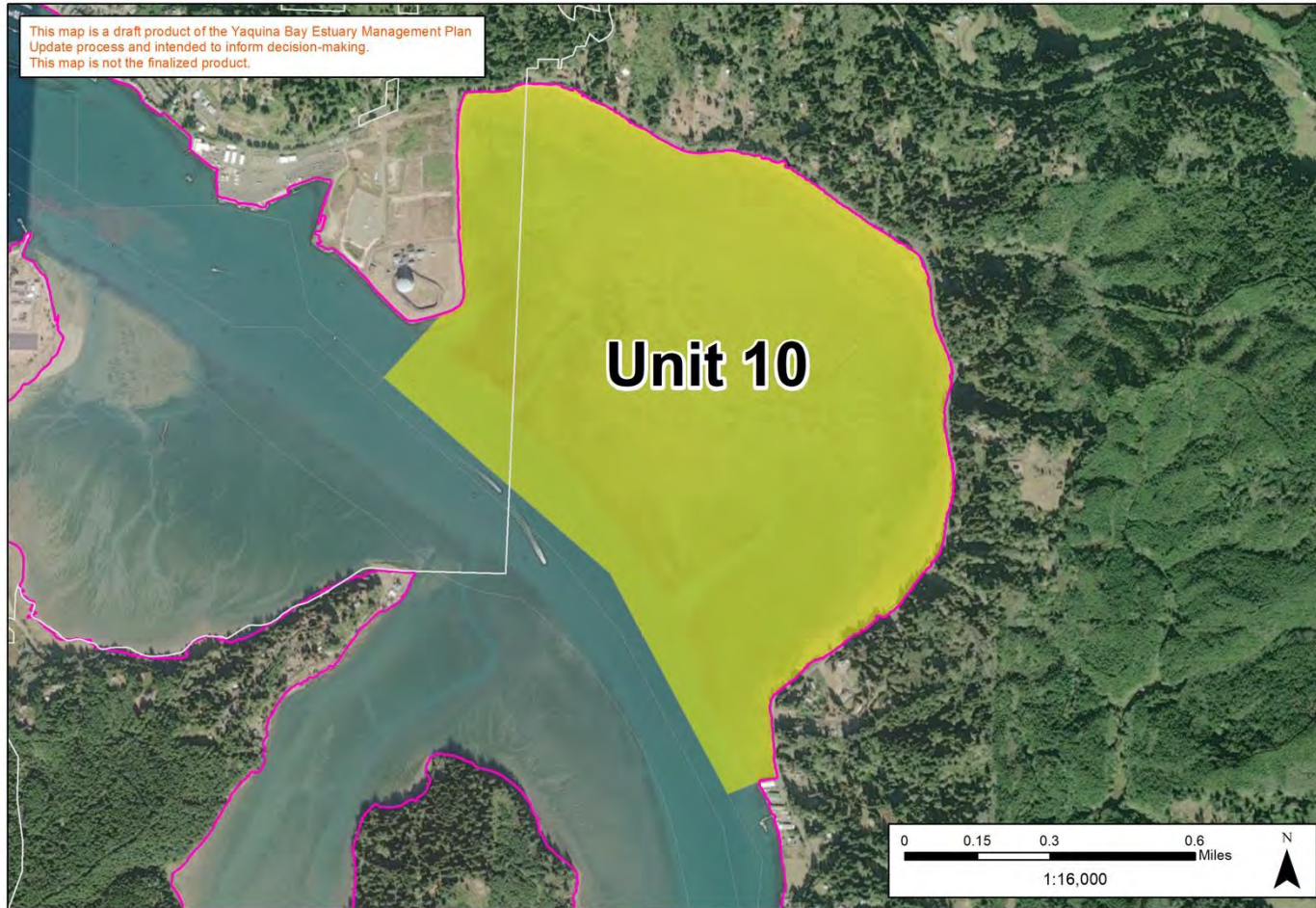
Management Unit 10 is similar in character and resource values to Management Unit 9. Due to the importance and sensitive nature of the resources in this area, permitted alterations shall be limited to those which result in only temporary, minor disturbances (e.g., several submerged crossings have been located in this area). More permanent alterations will be reviewed individually for consistency with the resource capabilities of the area.

Management Objective

Management Unit 10 shall be managed to preserve and protect natural resources and values.

Special Policies

1. Because this unit is suitable for native oyster re-establishment and restoration efforts are underway, impacts to existing Olympia oysters shall be avoided.
2. Deepening and widening of the federal navigation channel and turning basin into this management unit, which would impact the significant ecosystems within Sally's Bend, shall be avoided.



Estuary Management Unit: 10

Date: 8/25/2023,
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Figure 16. Estuary Management Unit 10, Yaquina Bay

Management Unit 12: YAQUINA BAY

Description

Management Unit 12 consists of the Corps of Engineers federally authorized navigation channel from the turning basin to the upstream extent of dredging at RM 14 in Toledo (see Figure 17). The channel above the turning basin is maintained to a depth of 18 feet up to Yaquina (RM 4+ 20), and to a depth of 10 feet from Yaquina up to Toledo. Natural resources of major significance in the unit are shellfish beds and fish spawning and nursery areas. The channel is used extensively for shallow and medium draft navigation, though there is currently no active commercial cargo traffic. Other uses include recreation, commercial harvest and aquaculture. Alterations within the channel include maintenance dredging and several minor alterations such as pilings, submerged cable crossings and navigation aids.

Classification: Development

This unit has been classified development as it is the federally authorized navigation channel and undergoes periodic maintenance dredging.

Resource Capability

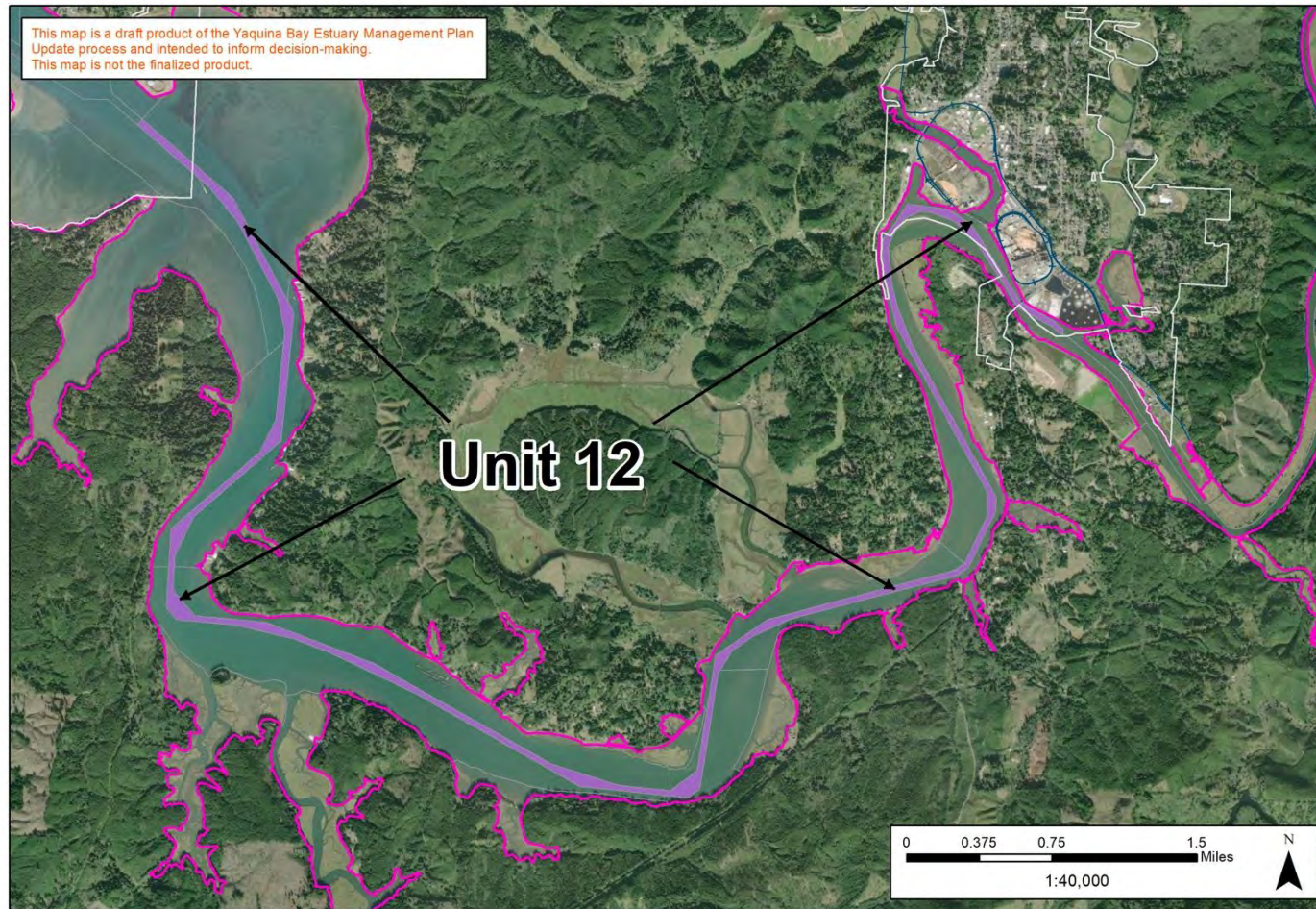
Resources within Management Unit 12 are subject to periodic major alterations a result of maintenance dredging activities. Authorized uses in this unit are not subject to resource capability requirements.

Management Objective

Management Unit 12 shall be managed to maintain navigational access to upriver areas above the turning basin.

Special Policies

1. Bridge crossing construction shall be permitted only for maintenance or replacement of the existing Butler Bridge crossing.



Estuary Management Unit: 12

Date: 8/24/2023.
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Legend

- Natural Units
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Figure 17. Estuary Management Unit 12, Yaquina Bay

Management Unit 13: YAQUINA BAY

Description

Management Unit 13 is the aquatic area between the navigation channel and the west shore, from the Racoon flat tideflats up to River Bend (see Figure 18). This mostly sub-tidal unit contains shellfish beds, fish spawning and nursery areas, some small tracts of tidal marsh, and important wildlife habitat. Uses in the area consist primarily of shallow and medium draft navigation, commercial harvest, and recreational boating and fishing. The area has natural characteristics that make it suitable for aquaculture. Alterations in the unit are limited to a few pilings and navigation aids.

Classification: Conservation

This unit is a partially altered area with some important resource characteristics that qualify for conservation management.

Resource Capability

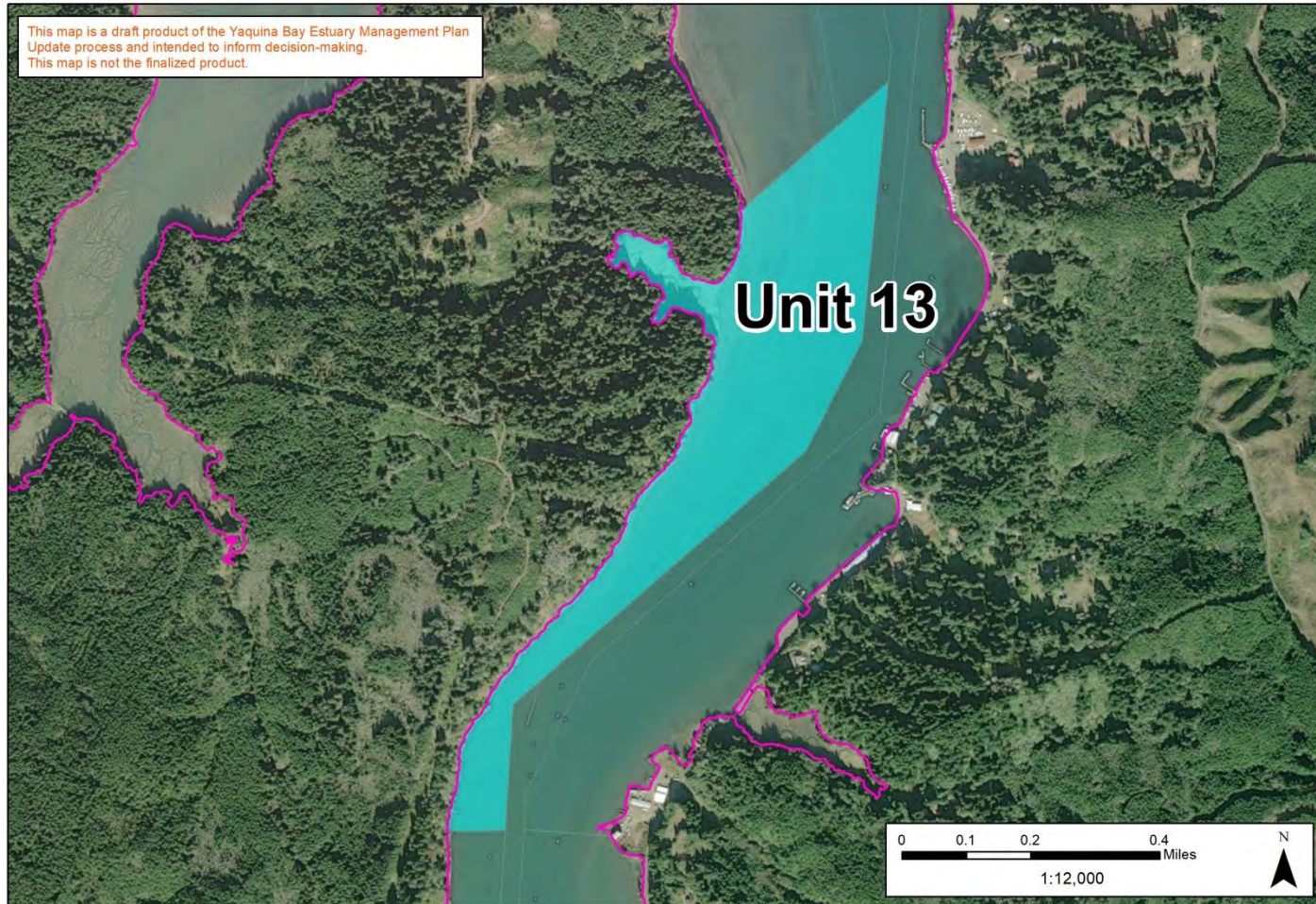
Unit 13 is part of the bay subsystem as described in the ODFW Habitat Classification System. This is a relatively protected area that provides a transition zone between marine and fresh water. It is within the portion of Yaquina Bay that is suitable for oyster culturing operations. Minor alterations that will not jeopardize the suitability of the area for aquaculture are consistent with the resource capability of this area. Shoreline stabilization and other more significant alterations shall be reviewed individually to assure consistency with this resource capability.

Management Objective

Management Unit 13 shall be managed to conserve natural resources, protect water quality and to provide for aquaculture related development.

Special Policies

1. To maintain the suitability of this area for aquaculture and otherwise protect important resources, development for high intensity water dependent recreation shall not be permitted in Management Unit 13.



Estuary Management Unit: 13

Date: 8/25/2023.
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Figure 18. Estuary Management Unit 13, Yaquina Bay

Management Unit 14: YAQUINA BAY

Description

Management Unit 14 is the area between the navigation channel and the east shore from Coquille Point up to River Bend (Oneatta Point) (see Figure 19). Natural resources include fish spawning and nursery areas, eelgrass and shellfish beds, tideflats, and wildlife habitat (all of minor significance). The predominant uses in the unit are small boat moorage, medium and shallow draft navigation, marine construction and repair, and recreation. Major alterations are present in the form of boat launches and haul outs, pilings, wharves, floating docks that serve marina development, and marine construction and repair operations. Additional alterations include fills, dredging, navigation aids, and stabilized shorelines (bulkheads and riprap).

Classification: Development

Unit 14 is a deep-water area close to shore with existing development of moderate intensity and thus is classified for development management.

Resource Capability

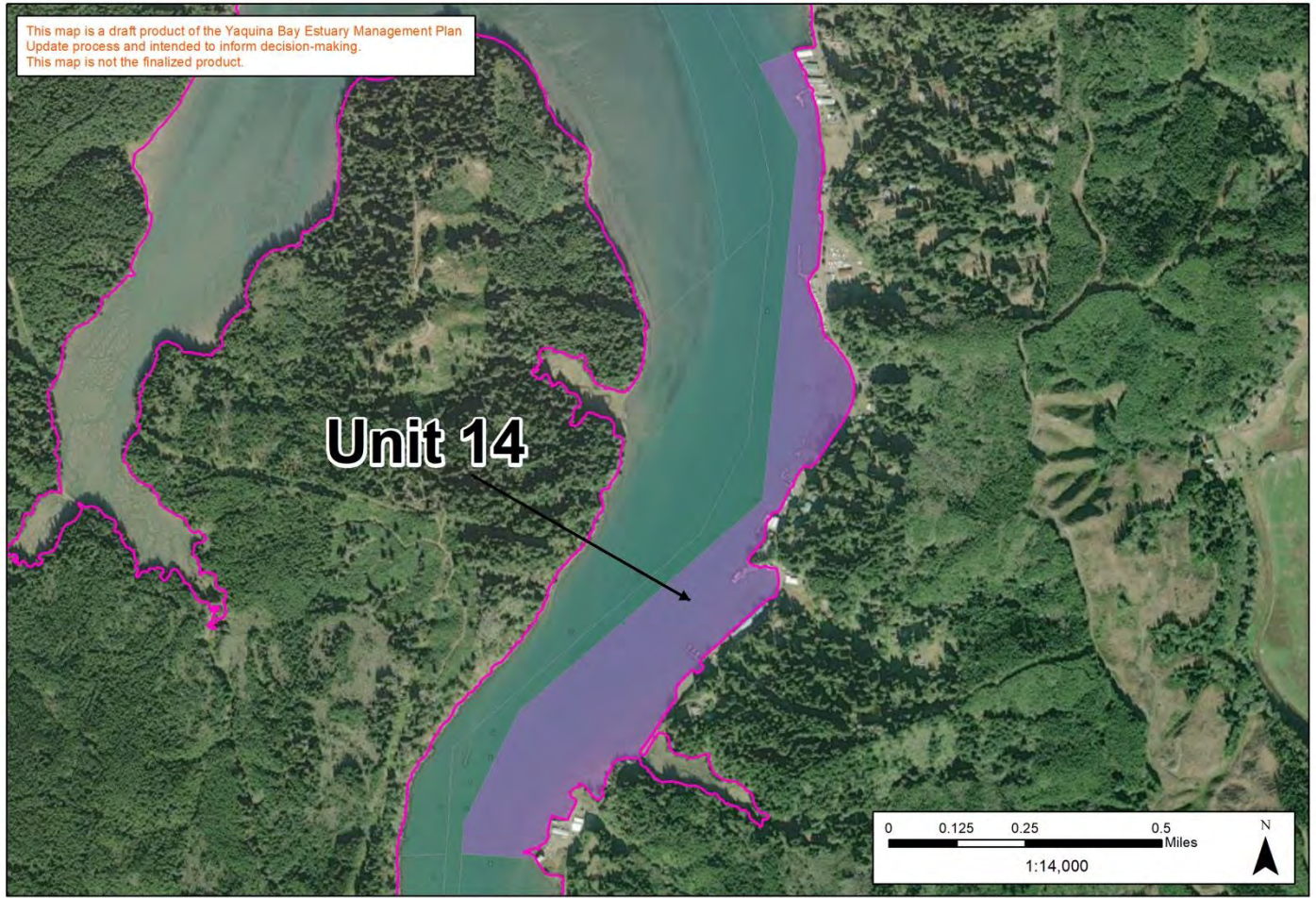
Numerous major alterations have occurred in this area in conjunction with past developments, including dredging, intertidal fills and structures such as piers and docks. This unit also has natural deep water adjacent to developable shorelands, one of the last such areas in the estuary. Development of these areas for water dependent uses is not subject to resource capability requirements and will be consistent with the purpose of a development management unit.

Management Objective

Management Unit 14 shall be managed to provide for water dependent development consistent with available levels of services and backup space.

Special Policies

1. Due to the limited water surface area available and the need for direct land to water access, alternatives (such as mooring buoys and dry land storage) to docks and piers for commercial and industrial use are not feasible in Unit 14. Multiple use facilities common to several users are encouraged where practical.



Estuary Management Unit: 14

Date: 8/25/2023
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- Legend**
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Figure 19. Estuary Management Unit 14, Yaquina Bay

Management Unit 15: YAQUINA BAY

Description

Management Unit 15 consists of Parker Slough east of County Road 515 (see Figure 20). Natural resources of major significance in the unit include tidal marsh, wildlife habitat and fish spawning and nursery areas. Uses within the unit are limited to some shallow draft navigation and minor recreational activity. Only minor alterations are present; these consist of pilings and a small area of riprapped shoreline.

Classification: Natural

This unit is classified natural in order to preserve important resource values associated with the intertidal flats and tidal marsh areas.

Resource Capabilities

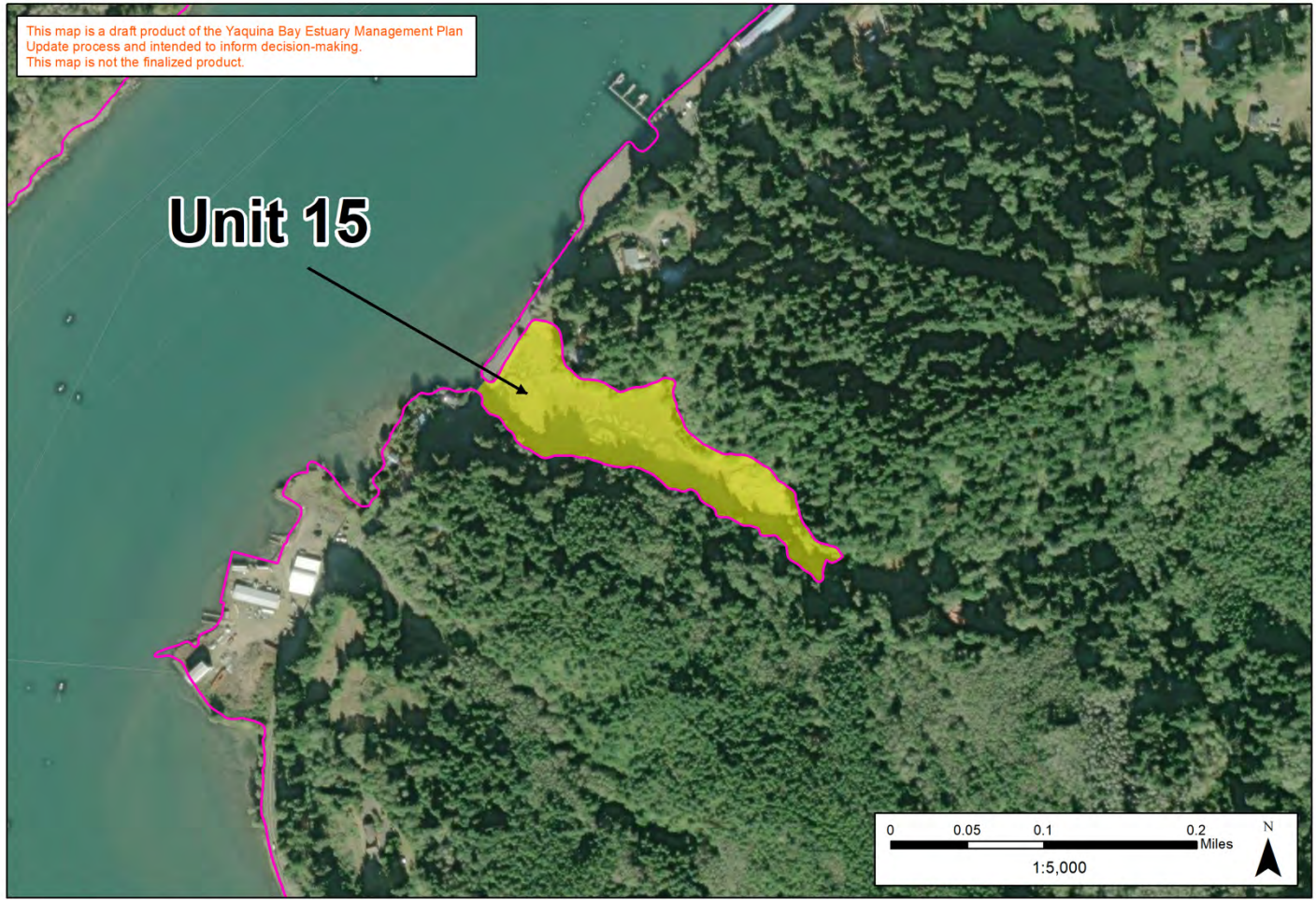
This unit is an essentially undisturbed slough sub-system. Alterations have occurred at the mouth of the slough through the construction of the county road and the subsequent bridging of the road dike. This bridge crossing spans the main sub-tidal channel of the slough, and is supported by pilings and riprapped shorelines. Alterations of this nature in conjunction with the maintenance or replacement of this bridge crossing will occur in the least sensitive portion of this unit and are necessary to maintain the tidal circulation and other resource capabilities of the remainder of the unit.

Management Objective

Management Unit 15 shall be managed to preserve and protect natural resources and values.

Special Policies

1. Bridge crossing construction may be permitted only for maintenance or replacement of the existing crossing.



Estuary Management Unit: 15

Date: 8/24/2023,
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 - Railroad

Figure 20. Estuary Management Unit 15, Yaquina Bay

Management Unit 16: YAQUINA BAY

Description

Management Unit 16 consists of the area between the navigation channel and the north shore of the bay from River Bend east to Grassy Point (see Figure 21). Natural resources of significance in the unit include shellfish beds, fish spawning and nursery areas and wildlife habitats. This unit represents a portion of the prime aquaculture area of the estuary and oyster farming is the primary use in the unit. Other uses in the unit include recreation and shallow draft navigation. Alterations within the unit include pilings, floating docks, pier structures and riprap.

Classification: Conservation

This unit is an area suitable and needed for aquaculture and related activities and is thus classified conservation in order to manage for long term uses of renewable resources.

Resource Capability

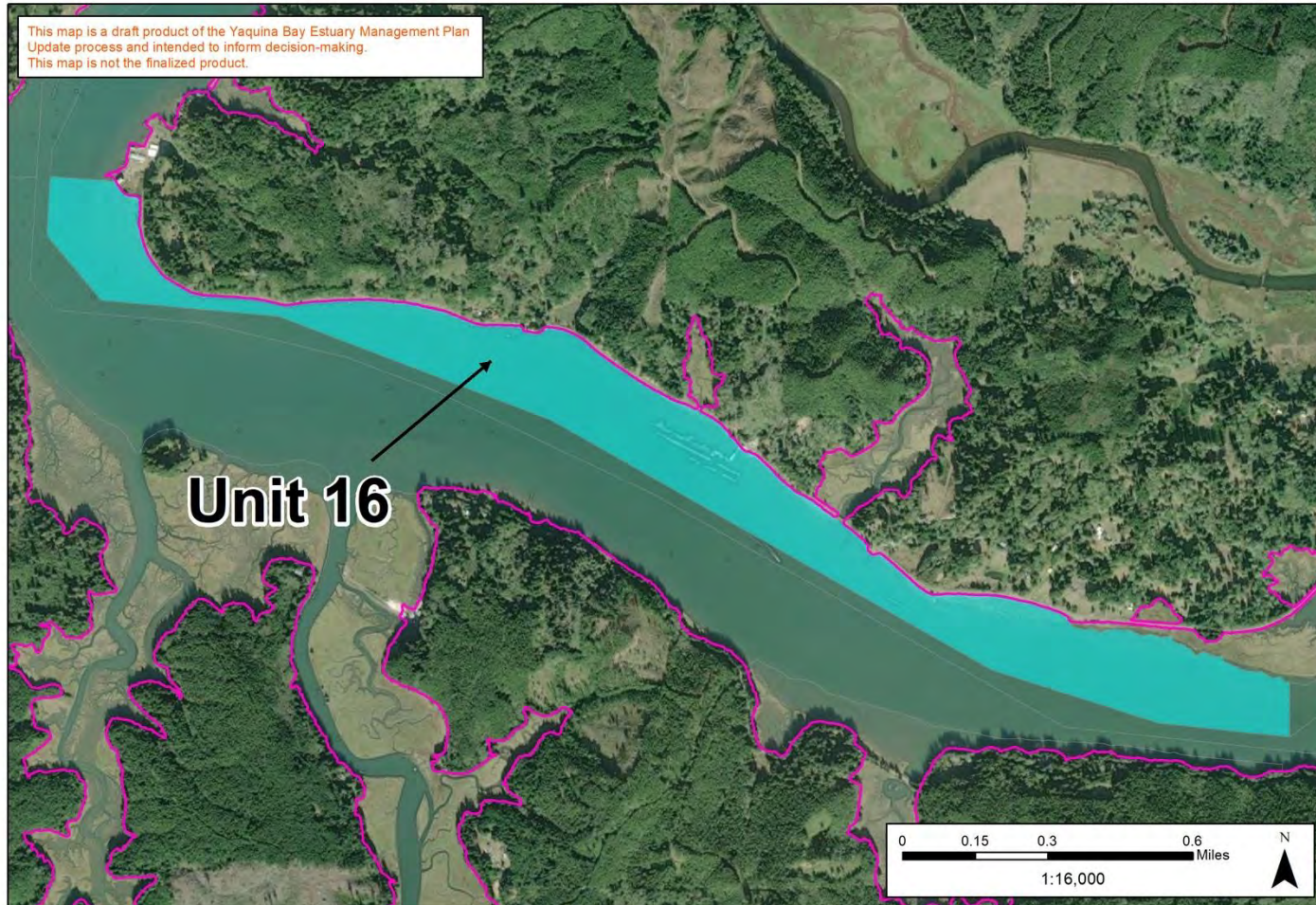
Unit 16 has been used for decades as a commercial oyster growing area. Water quality and other characteristics make this area especially suitable for such use. Numerous minor alterations needed for these commercial aquaculture operations have taken place in this area. These include pilings, piers, floating docks and stabilized shorelines. Similar types of minor alterations are necessary for the operation of the oyster industry and are consistent with the resource capabilities of this unit.

Management Objective

Management Unit 16 shall be managed to maintain and enhance natural resources and aquaculture opportunities and to provide for aquaculture related development.

Special Policies

1. Aquaculture facilities may include receiving, processing and retail sales facilities.
2. To maintain the suitability of this area for aquaculture and otherwise protect important resources, development for high intensity water dependent recreation shall not be permitted in Management Unit 16.



Estuary Management Unit: 16

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- Legend**
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 - Railroad

Figure 21. Estuary Management Unit 16, Yaquina Bay

Management Unit 17: YAQUINA BAY

Description

Management Unit 17 consists of the area between the navigation channel and the south shore of the bay from River Bend east to Grassy Point (see Figure 22). Natural resources of significance include shellfish beds, fish spawning and nursery areas, and wildlife habitat. This unit represents a portion of the prime aquaculture area of the estuary and oyster farming is the principal use in the unit. Other uses in the unit include shallow and medium draft navigation, recreation, and commercial harvest. Alterations within the unit are minor and include pilings, floating docks, and riprap.

Classification: Conservation

This is an area suitable and needed for aquaculture and related activities and is thus classified conservation in order to manage for long term uses of renewable resources.

Resource Capability

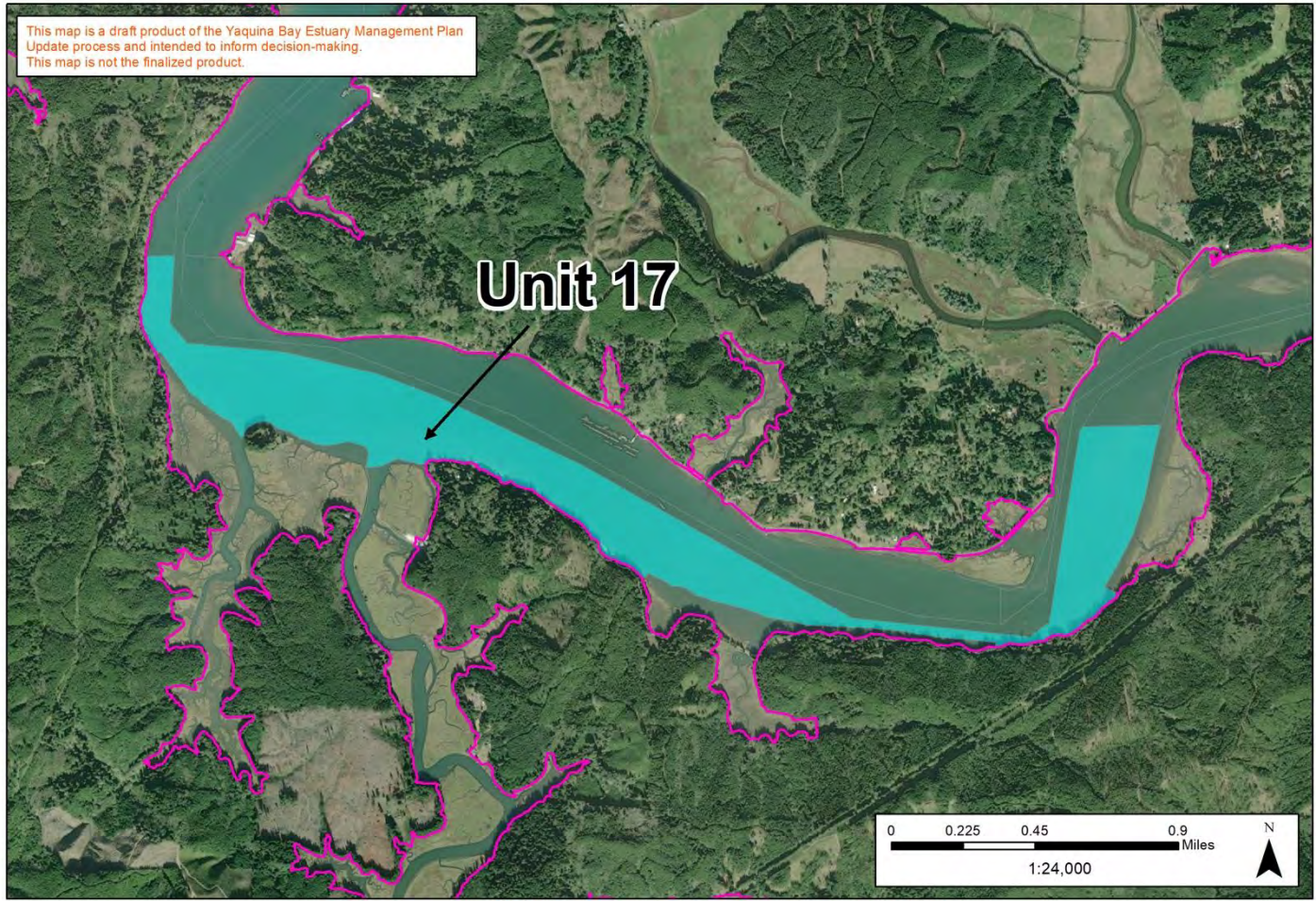
Unit 17 has been used for decades as a commercial oyster growing area. Water quality and other characteristics make the area especially suitable for such use. Numerous minor alterations needed for these commercial aquaculture operations have taken place in this area. These include pilings, piers, floating docks and stabilized shorelines. Similar types of minor alterations will be necessary for the continued operation of the oyster industry and are consistent with the resource capabilities of this unit.

Management Objective

Management Unit 17 shall be managed to maintain and enhance natural resources and aquaculture opportunities and to provide for aquaculture related development.

Special Policies

1. Aquaculture facilities may include receiving, processing, and retail sales facilities.
2. To maintain the suitability of this area for aquaculture and otherwise protect important resources, development for high intensity water dependent recreation shall not be permitted in Management Unit 17.



Estuary Management Unit: 17

Date: 8/24/2023.
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 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

 Natural Units	 Estuary Boundary
 Conservation Units	 City Limits
 Development Units	+ Railroad

Figure 22. Estuary Management Unit 17, Yaquina Bay

Management Unit 18: YAQUINA BAY

Description

Management Unit 18 includes the tidal marsh complex and intertidal area of McCaffery Slough (see Figure 23). This is an important natural resource area, with a major tract of tidal marsh providing important primary productivity and extensive wildlife habitat. Uses in the area are confined to limited low intensity recreational activities. Substantial portions of the unit are owned by the Wetlands Conservancy and are managed for conservation. Most of the aquatic area and wetlands of this unit remain essentially unaltered.

Classification: Natural

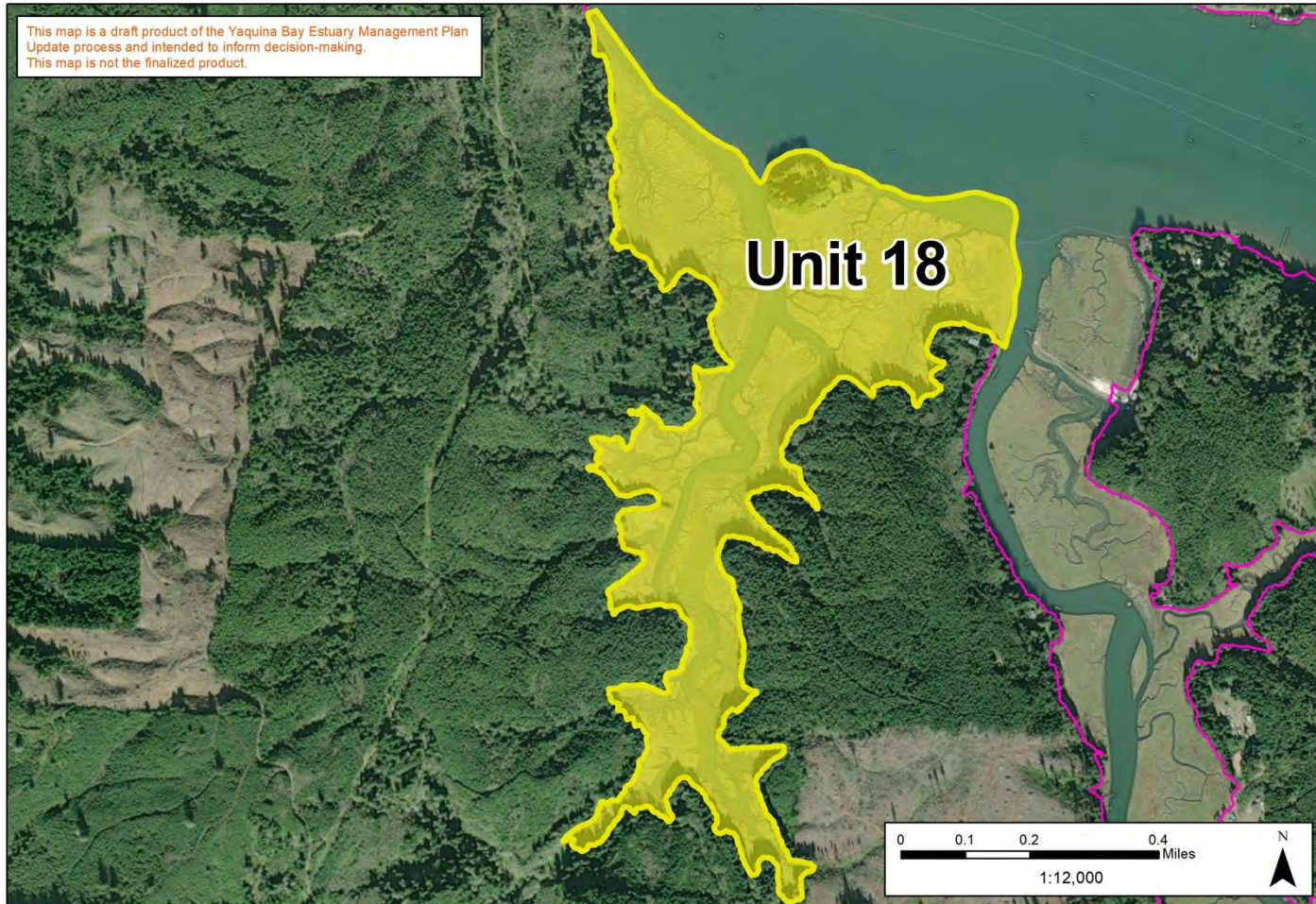
As a major tract of tidal marsh, this unit is classified natural in order to preserve its essential resource characteristics.

Resource Capability

The McCaffery Slough area provides major resource values in the form of primary productivity and wildlife habitat. This is a sensitive area and alterations shall be limited to those activities that do not impact these major natural resource values. Minor structural alterations such as pilings or navigation aids are consistent with the resource capabilities of this area as long as they do not significantly degrade productivity or wildlife habitat.

Management Objective

Management Unit 18 shall be managed to preserve and protect natural resources and values.



Estuary Management Unit: 18

Date: 8/24/2023.
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 23. Estuary Management Unit 18, Yaquina Bay

Management Unit 19: YAQUINA BAY

Description

Management Unit 19 includes all of the tidal marsh area of Poole's Slough (see Figure 24). This area is part of the largest and most diverse tidal marsh complex in the estuary and provides an extensive area of significant wildlife habitat. Uses in this area include shallow draft navigation, aquaculture activities, and recreational use. Substantial portions of the unit are owned by the Wetlands Conservancy and are managed for conservation.

Management Unit 19 also includes the main sub-tidal channel of Poole's Slough. This area is presently used for oyster culture and some limited development of facilities is present. The channel is also used for shallow draft navigation in conjunction with aquaculture operations. This area is partially altered, with docks, pilings and other minor structural improvements.

Classification: Natural

This area is a major tract of tidal marsh and is classified natural in order to preserve important resource values.

Resource Capability

Unit 19 provides a large area of tidal marsh and the associated resource values, particularly primary productivity and wildlife habitat. Alterations that do not significantly impact these values (e.g., piling, navigation aids and other minor structural alterations) are consistent with the resource capabilities of this area.

The sub-tidal portion of Poole's Slough is composed primarily of fine organic sediments, and many areas of the channel provide protected rearing sites for juvenile fishes and crabs, and prime growing areas for oysters. Structural alterations that do not overly impede circulation, occupy excessive surface area or adversely affect water quality are consistent with the resource capabilities of this unit.

Management Objective

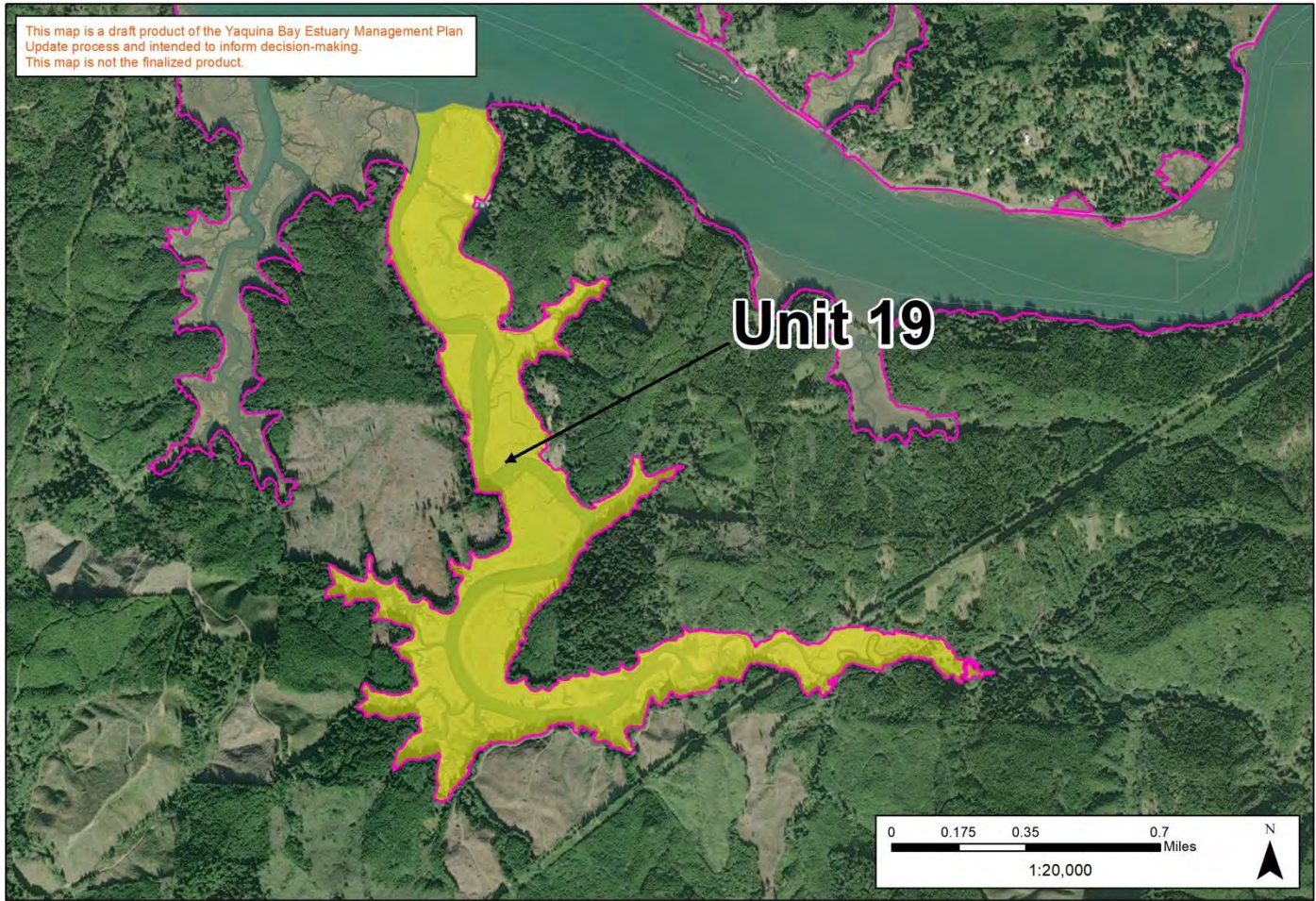
Management Unit 19 shall be managed to preserve and protect natural resources and values.

Special Policies

1. A Goal 16 exception has been taken to allow aquaculture development in Unit 19 at a level of intensity greater than that normally permitted in a natural management unit. New dredge and fill activities for aquaculture development shall be limited to those activities specifically authorized by the exception statement (see Appendix C). Alterations proposed which are not included within the scope of the exception statement and are not consistent

with the resource capabilities and management objective of this unit are not permitted unless appropriate revisions to the exception are adopted through the plan amendment process.

2. The proposed goal exception will be a phased development (see exception statement). Phases II and III of the project are to be undertaken in accordance with the need justification set forth in the exception statement. Additional expansion for uses other than the proposed seed nursery operation is not permitted under the provisions of this exception.
3. The proposed project size is felt to be adequate to provide seed nursery production for Yaquina Bay (with the possible eventuality of providing seed to other currently un-utilized grounds in other local estuaries). Additional, similar projects shall require further justification of need based on an analysis including, but not limited to, the following information: seed market conditions, demand, and oyster production opportunities.
4. Mitigation for adverse impacts of dredge and fill activities in the tidal marsh area will be required. The nature and extent of mitigation required and final site selection shall be addressed during the Fill and Removal permit process.



Estuary Management Unit: 19

Date: 8/25/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

 Natural Units	 Estuary Boundary
 Conservation Units	 City Limits
 Development Units	++ Railroad

Figure 24. Estuary Management Unit 19, Yaquina Bay

Management Unit 20: YAQUINA BAY

Description

Management Unit 20 is composed of Winant Slough and Johnson Slough on the north side of the estuary (see Figure 25). These small sloughs include tidal marshes, tideflats, and wildlife habitats that are of major significance. Use in the sloughs is limited to minor recreational activity. Small areas of riprapped shoreline and pilings at the mouths of the sloughs represent the only alterations present. Winant Slough is in public ownership (Lincoln County) and is protected by conservation easement. A small portion of the upper portion of Johnson Slough is in conservation ownership (The Wetlands Conservancy), while the majority is held in several private ownerships.

Classification: Natural

Management Unit 20 is considered to be a major tract of tidal marsh and is classified natural in order to protect essential resource values.

Resource Capabilities

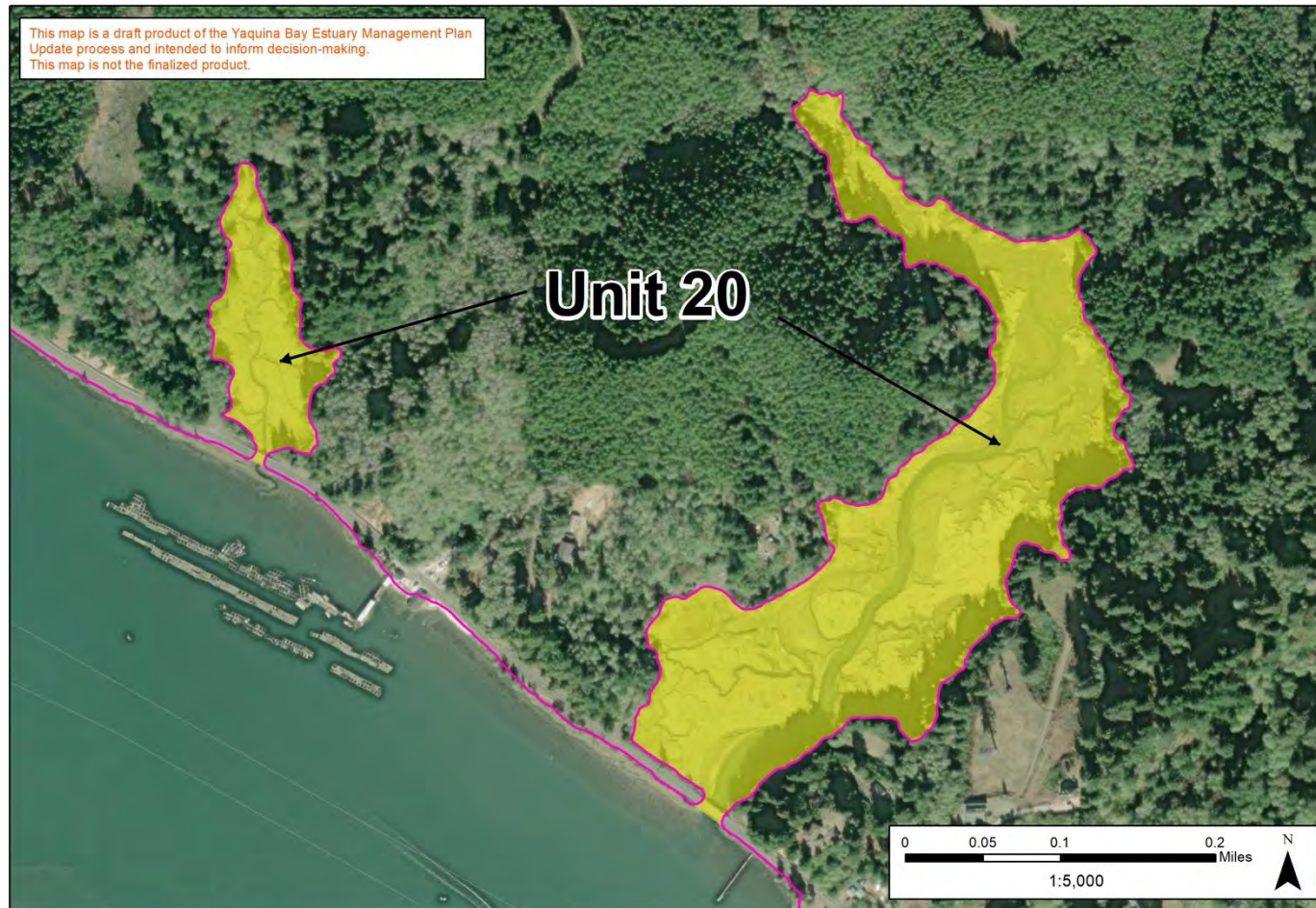
Areas included within Unit 20 are important components of the estuarine system, in that they include tracts of productive tidal marsh and intertidal channels that have remained essentially unaltered. This is a sensitive area. Minor structural alterations that will not adversely impact, or will improve, tidal flow or the productive value of the marsh areas are permitted, such as minor pilings and bank stabilization activities associated with the maintenance or replacement of the bridge crossings at the mouths of the sloughs. Such activities may be essential to the maintenance of the resource functions and capabilities of these areas.

Management Objective

Management Unit 20 shall be managed to preserve and protect the resource values of the tidal marshes, tideflats and wildlife habitats.

Special Policies

1. Bridge crossing construction will be permitted for maintenance or replacement of the existing crossing.



Estuary Management Unit: 20

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Int
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 25. Estuary Management Unit 20, Yaquina Bay

Management Unit 21: YAQUINA BAY

Description

Management Unit 21 consists of Flesher Slough and the tidflats at the slough mouth down to MLLW (see Figure 26). The unit contains tidal marsh and wildlife habitat of major significance. Uses within the unit include limited shallow draft navigation and some recreational activity. The slough has been altered near its mouth by the road (County Road 520) crossing. The road crossing dike has a small culvert through it that restricts tidal exchange within the slough.

Classification: Natural

This area is a major intertidal tract and is classified natural in order to preserve natural resource values.

Resource Capability

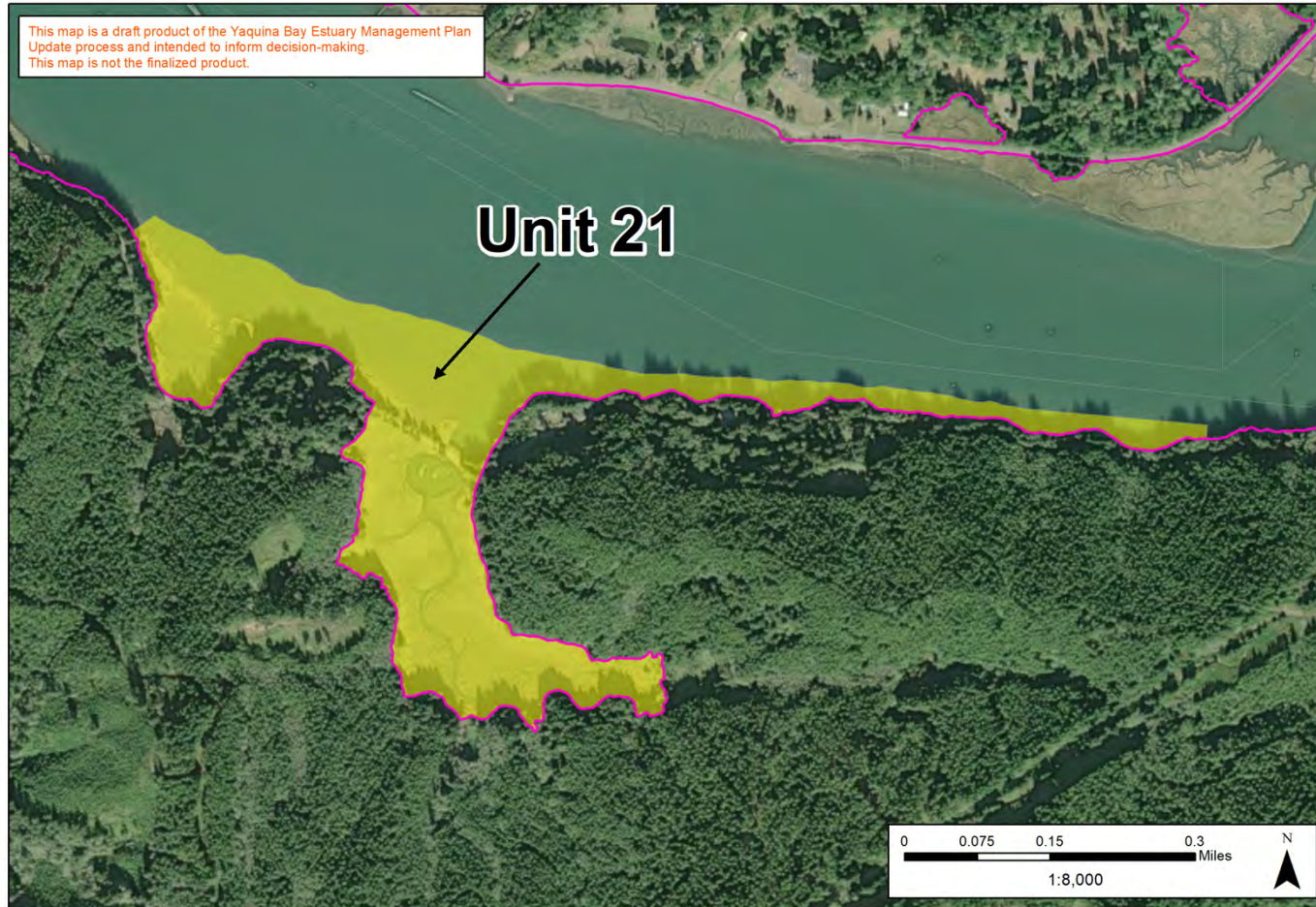
Flesher Slough is an important intertidal flat and tidal marsh area. Substrates in the slough are mostly fine-grained organic materials, and small tracts of eelgrass are present near the mouth of the main slough channel. The slough mouth has been severely altered by placement of fill for the county road dike. Currently, the small culvert through which the slough fills and drains allows very limited tidal circulation. Removal activities to install additional culverts or the construction of a bridge crossing would greatly improve circulation and productivity of this area. Activities undertaken for the purpose of active restoration align with the resource capabilities of the unit and would result in long-term benefits that will more than offset the short term disturbance to the area.

Management Objective

Management Unit 21 shall be managed to protect and, where appropriate, enhance the natural resources and values.

Special Policies

1. Active restoration activities that improve ecosystem function in Flesher Slough are allowed, consistent with the resource capabilities of the unit.



Estuary Management Unit: 21

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 26. Estuary Management Unit 21, Yaquina Bay

Management Unit 22: YAQUINA BAY

Description

Management Unit 22 consists of the tidal marsh and tideflat area located between the navigation channel and the southeast shoreline and includes the areas known locally as Blind Slough and Busher Flats (see Figure 27). The unit contains both tidal marsh and wildlife habitat of major significance. Uses within the unit are limited to some shallow draft boat traffic and minor recreational use. The area is unaltered, except for a few abandoned pilings.

Classification: Natural

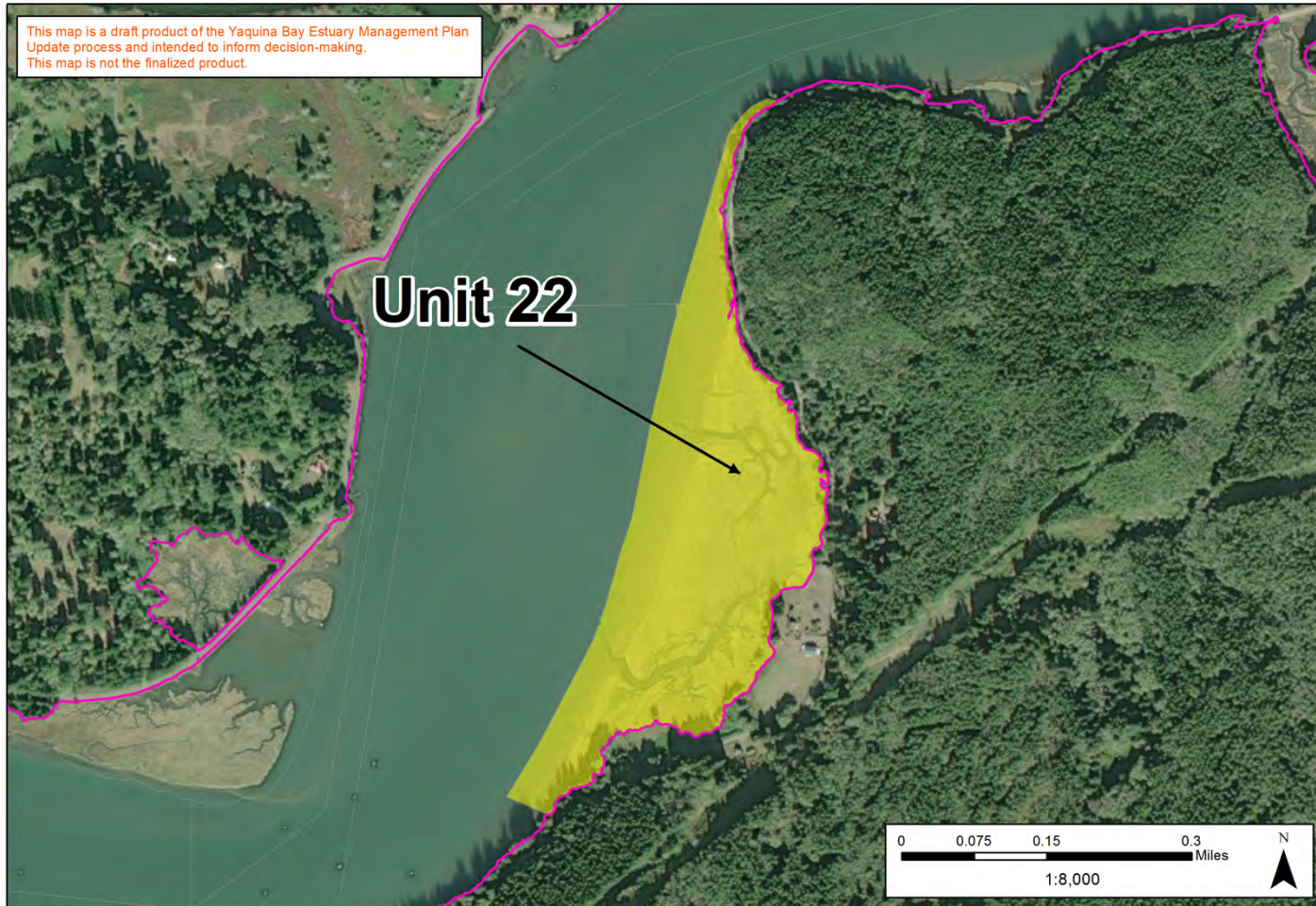
This unit is classified natural in order to preserve the resource values of the major tracts of tideflats and tidal marsh.

Resource Capability

Busher Flats is an important resource area, with numerous natural resource values including productive intertidal and shallow sub-tidal areas, tidal marsh, and important waterfowl habitat. Alterations that would occupy or remove significant amounts of intertidal surface area could have negative impacts on these resource values and their contribution to the estuarine system. However, limited minor alterations such as pilings or navigation aids would not be a significant impact on these values and are consistent with the resource capabilities of this area.

Management Objective

Management Unit 22 shall be managed to preserve the resource values associated with the important tideflats, tidal marsh and wildlife habitat present within the unit.



Estuary Management Unit: 22

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Figure 27. Estuary Management Unit 22, Yaquina Bay

Management Unit 23: YAQUINA BAY

Description

Management Unit 23 consists of the major tract of tidal marsh known as Grassy Point, extending from Lower High Water (LHW) inland to the line of non-aquatic vegetation (see Figure 28).

Classification: Natural

This unit is a major tract of tidal marsh and is classified natural to preserve its important resource values.

Resource Capability

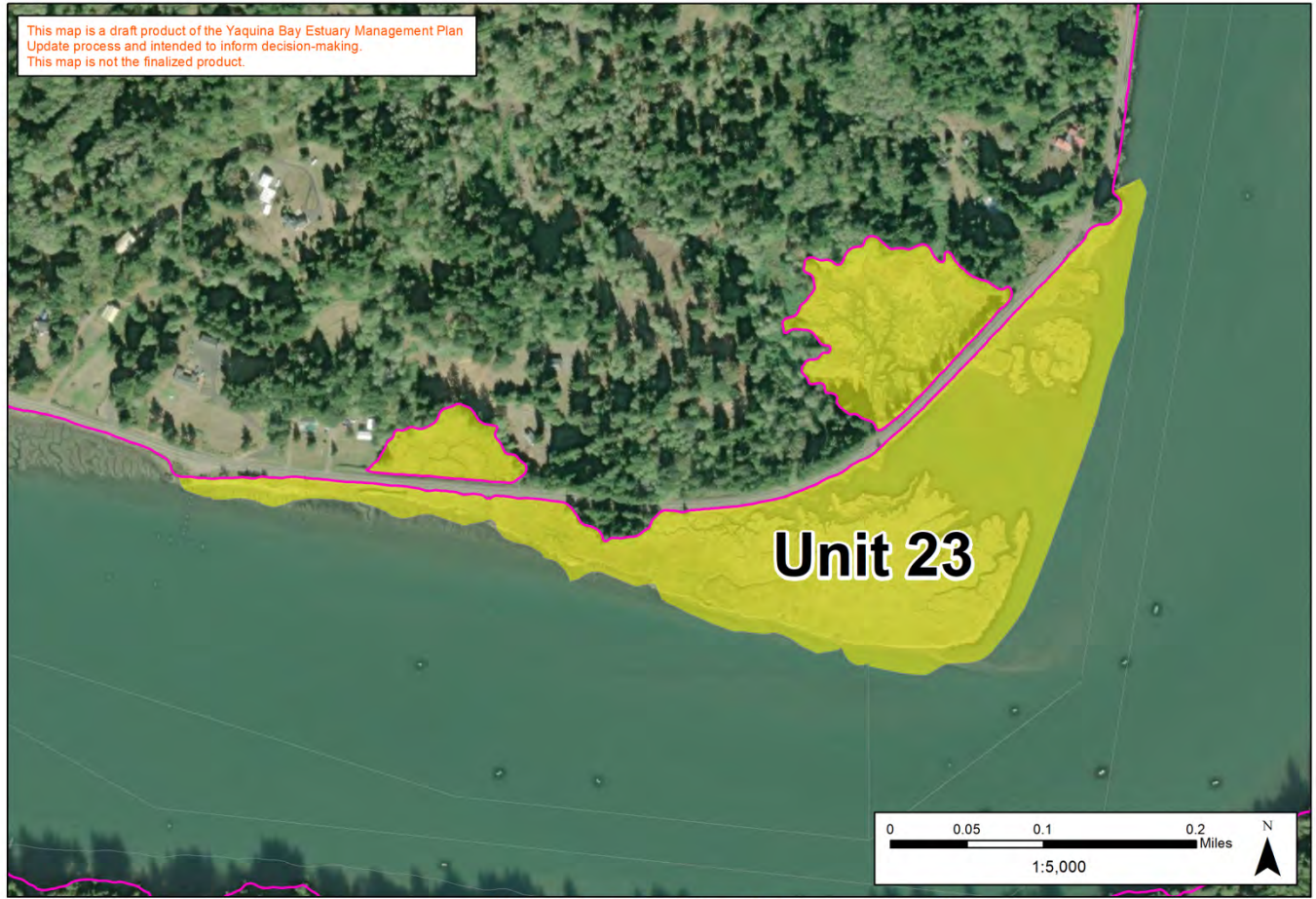
As a major tract of tidal marsh, this unit should be kept free of alterations that might result in channelization or disruption of tidal flow, destruction of wetland vegetation, or excessive soil disturbance. Minor structural alterations such as pilings or navigation aids are consistent with maintaining the area's natural resource values, particularly those activities associated with improving tidal circulation for that portion of this unit north of County Road 515.

Management Objective

Management Unit 23 shall be managed to preserve, protect and, where appropriate, enhance the natural values of its salt marsh and wildlife habitat.

Special Policies

1. Improvement of tidal flow to those marsh areas north of Yaquina Bay Road is considered to be active restoration consistent with the purposes and resource capabilities of this unit.



Estuary Management Unit: 23

Date: 8/24/2023.
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - + Railroad

Figure 28. Estuary Management Unit 23, Yaquina Bay

Management Unit 24: YAQUINA BAY

Description

Management Unit 24 includes the area between the navigation channel and the north shore from Grassy Point east to Criteser's Moorage (see Figure 29). This unit contains a number of natural resources of major significance, including eelgrass and shellfish beds, fish spawning and nursery areas, tideflats and wildlife habitat. Medium and shallow draft navigation and recreational activity are the major uses within the unit. Alterations include riprapped shorelines, pilings, navigation aids, and dikes and tidegates (at the mouth of Boone and Nute Sloughs), which are maintained by Mill 4 Drainage District.

Classification: Natural

This unit is classified natural in order to preserve the important diversity of natural resources values in the area.

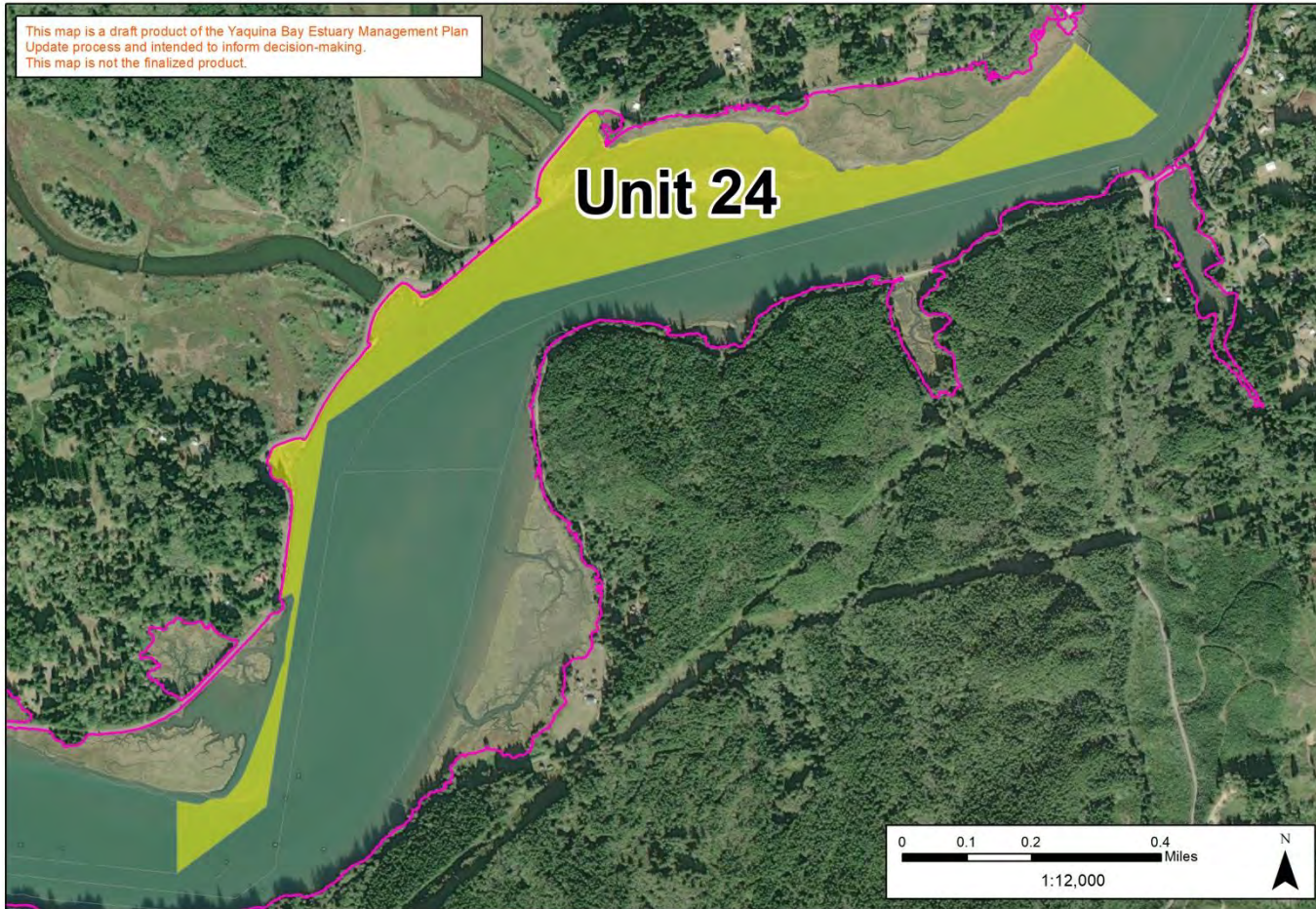
Resource Capability

Unit 24 is an area of diverse resource values, including productive intertidal and shallow sub-tidal areas, shellfish beds, fish spawning and nursery areas, and eelgrass beds. Activities and uses consistent with the resource capabilities of this unit include:

- Minor structural alterations such as pilings or small docks that do not occupy excessive surface area or significantly affect circulation patterns;
- Temporary alterations such as dredging for submerged cable crossings;
- Active restoration to improve ecosystem function of the natural resources of the unit.

Management Objective

Management Unit 24 shall be managed to preserve natural resources such as shellfish beds, productive tideflats and wildlife habitat.



Estuary Management Unit: 24

Date: 8/24/2023.
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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 29. Estuary Management Unit 24, Yaquina Bay

Management Unit 25: YAQUINA BAY

Description

Management Unit 25 takes in the area between the navigation channel and the south shore from the upriver end of Management Unit 22 up to the Toledo city limits (see Figure 30). This unit has shellfish beds, fish spawning and nursery areas, and wildlife habitat, all of major significance. Major uses within the unit include recreation and medium and shallow draft navigation. Numerous minor alterations are present within the unit. They include dredging, riprap, bulkheads, piers, wharves, floating docks, pilings, and the Port of Toledo's boat-launch and mooring float at the Toledo Airport.

Classification: Conservation

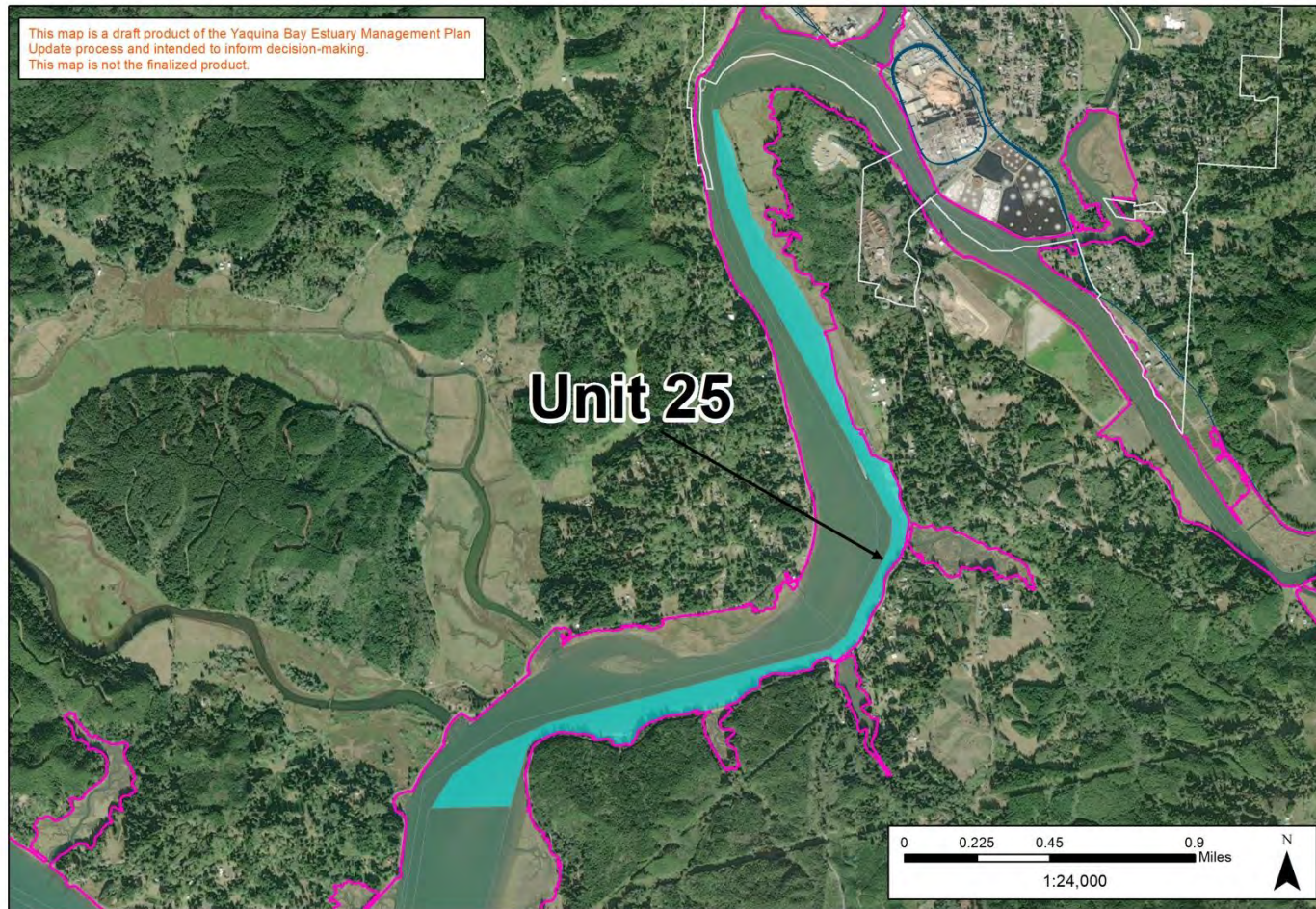
As a partially altered area adjacent to development of moderate intensity, this unit is classified conservation in order to conserve resource values and manage for development that requires only minor alterations.

Resource Capability

Unit 25 is an area with a number of important resource characteristics; however the area has a number of significant existing alterations at several locations, including the Port of Toledo public boat launch facility. Portions of this unit adjacent to the Toledo airport and the existing port facility are suitable for water dependent uses. Minor structural alterations such as piers, pilings, docks and shoreline stabilization in conjunction with water dependent uses would not have significant adverse effects and would be similar to the existing development in this area.

Management Objective

Management Unit 25 shall be managed to conserve natural resources.



Estuary Management Unit: 25

Date: 8/24/2023.
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Legend

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- City Limits
- Railroad

Figure 30. Estuary Management Unit 25, Yaquina Bay

Management Unit 27: YAQUINA BAY

Description

Management Unit 27 is a large tidal marsh area immediately east of the mouth of Nute Slough, extending upriver to the Port of Toledo's paddle park at approximately river mile 10.3 (see Figure 31). The tidal marsh and wildlife habitat within this unit are considered to be of major significance. The unit also includes a small tideflat area that supports important shellfish beds. Use within the unit is confined to recreational activities. A small portion of this unit is diked by the county road crossing, but culverts allow relatively free flow of tidal waters into this area. The major portion of this unit is in public ownership (State of Oregon Board of Higher Education and the Port of Toledo).

Classification: Natural

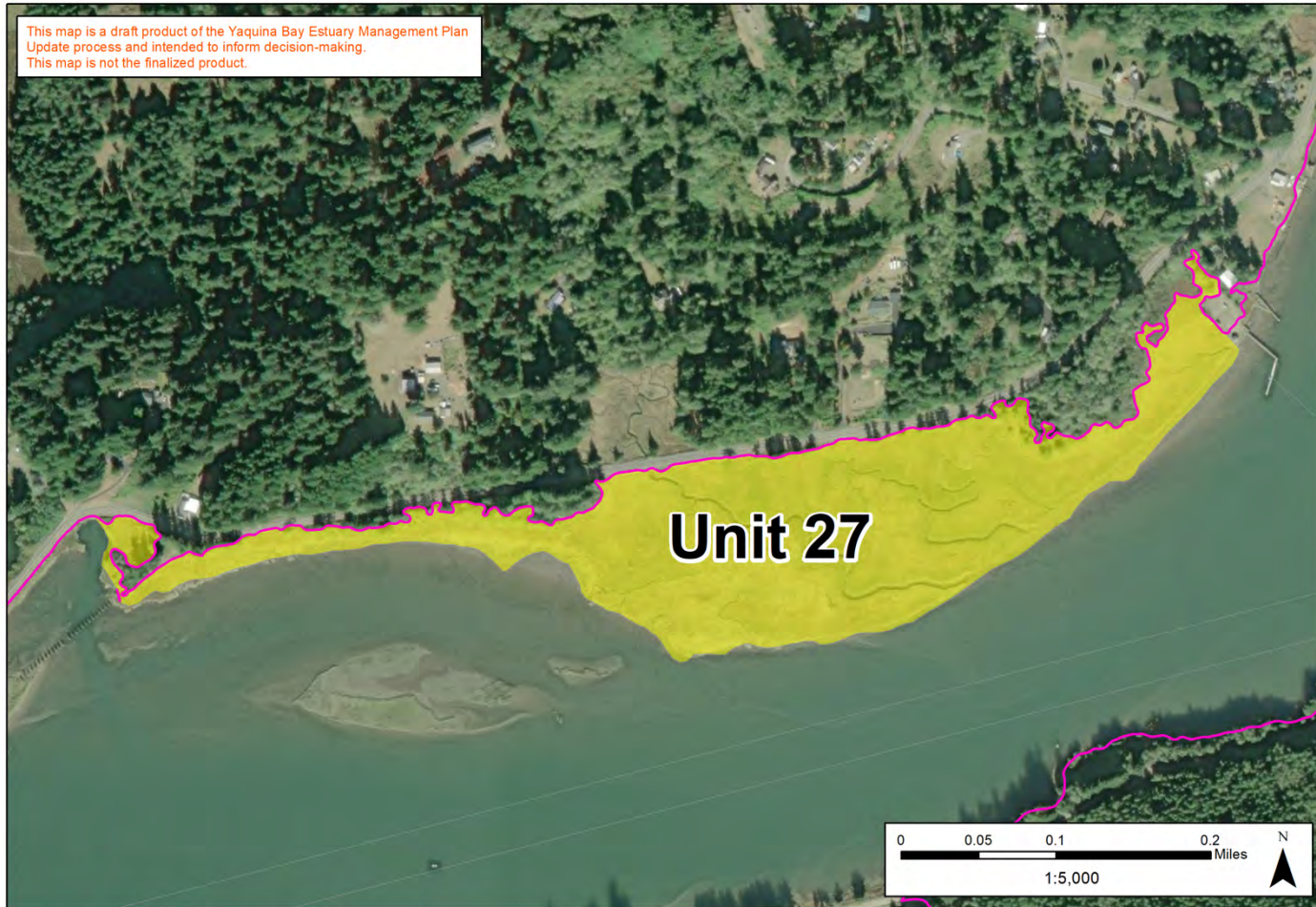
As a major tract of tidal marsh, this unit is classified natural in order to preserve critical resource values.

Resource Capability

Unit 27 is an important area for primary productivity and wildlife habitat values. This is a highly sensitive area and the resource values can be subject to disturbance from structural developments or alterations. Minor structural improvements for needed public uses such as navigation aids would be consistent with the resource capabilities of this unit.

Management Objective

Management Unit 27 shall be managed to preserve and protect the resource values of the tidal marsh and tidal flats within the unit.



Estuary Management Unit: 27

Date: 8/24/2023.
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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 31. Estuary Management Unit 27, Yaquina Bay

Management Unit 28: YAQUINA BAY

Description

Management Unit 28 consists of three small sloughs formed by the mouths Babcock Creek, Montgomery Creek and a third unnamed creek, located along the south shore of the bay west of the Toledo Airport (see Figure 32). These sloughs contain important intertidal flats, channels and tidal marshes, and provide fish spawning and nursery areas and wildlife habitat of major significance. Minor recreational activity is the only current use within this unit. All three sloughs are partially closed off at the mouth by the county road crossings but piling bridges or culverts allow the sloughs to fill and drain with the tides.

Classification: Natural

These areas are classified natural in order to preserve the diversity of important resource values present.

Resource Capability

The areas contained in unit 28 are typical of the small sloughs found in the middle section of the estuary. The areas are primarily intertidal flats, with low and high tidal marshes around the fringes. In addition to their value for productivity, these sloughs provide a protected environment for rearing of juvenile fishes and crabs as well as valuable waterfowl feeding and resting sites. Minor structural alterations associated with low intensity uses are consistent with the resource capabilities of the unit.

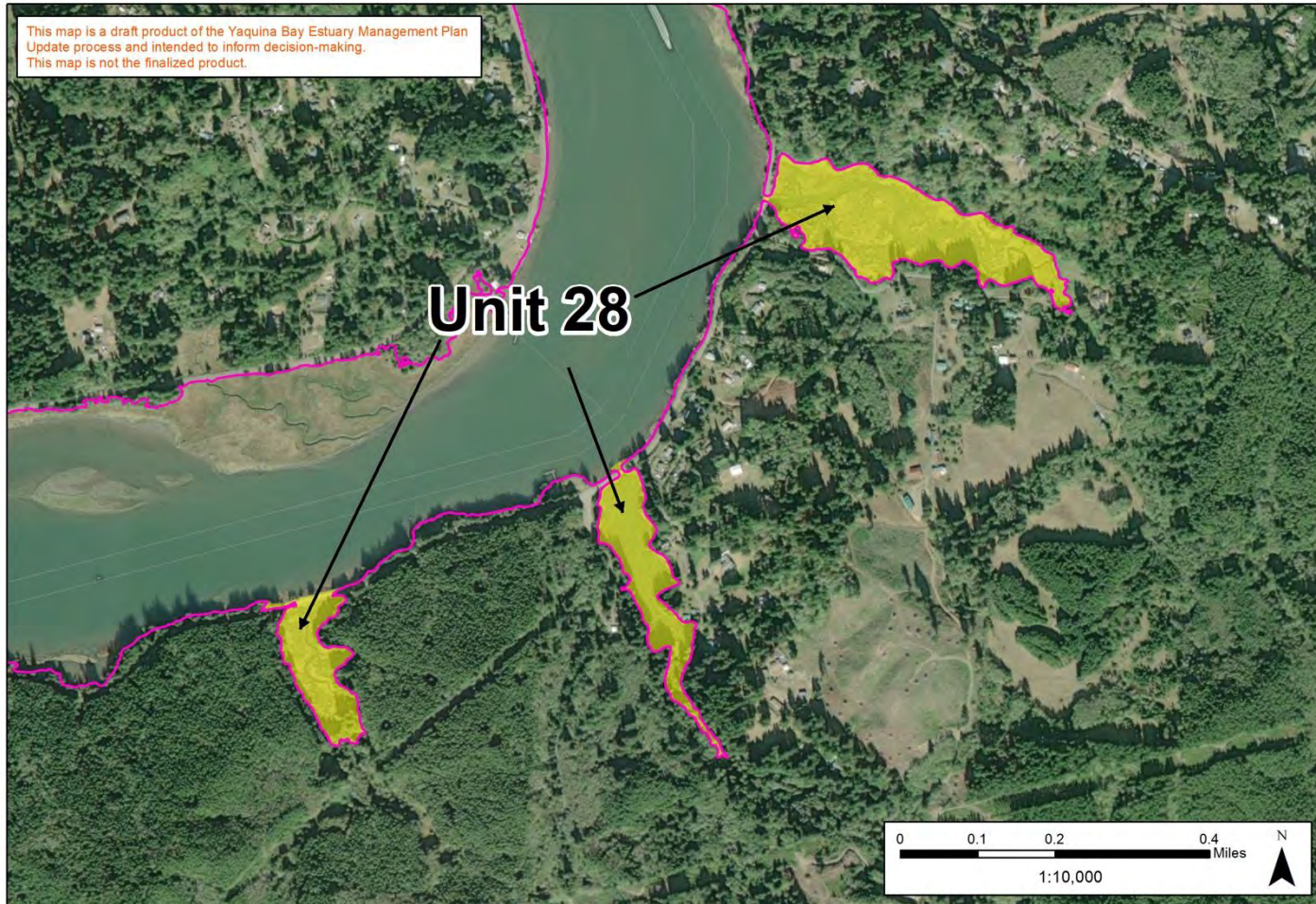
Tidal circulation is currently impeded in these areas by the county road crossings. The construction of bridge crossings or the placement of additional or larger culverts to enhance tidal circulation would improve resource values and would be consistent with the area's resource capabilities.

Management Objective

Management Unit 28 shall be managed to preserve, protect and where appropriate, enhance the natural resources and values.

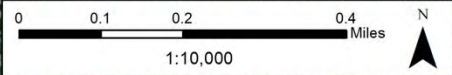
Special Policies

1. Bridge crossing construction and/or culvert replacement activities may be permitted for maintenance or replacement of existing crossings or for active restoration of tidal exchange in these sloughs. Alterations for these activities are consistent with the purpose and resource capabilities of this unit.



This map is a draft product of the Yaquina Bay Estuary Management Plan Update process and intended to inform decision-making. This map is not the finalized product.

Unit 28



Estuary Management Unit: 28

Date: 8/24/2023.
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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 32. Estuary Management Unit 28, Yaquina Bay

Management Unit 30: YAQUINA BAY

Description

Management Unit 30 takes in the area between the navigation channel and the north shore from the Port of Toledo Paddle Park east to the Toledo city limits (see Figure 33). Shellfish beds, fish spawning and nursery areas and wildlife habitats of minor significance are found within the unit. Uses within the unit include a launch and moorage facility for small boats, medium and shallow draft navigation, maintenance dredging, and recreation. Significant numbers of pilings and dolphins formerly used for log storage are present, as well as a number of other minor alterations including riprap, piers and floating docks.

Classification: Conservation

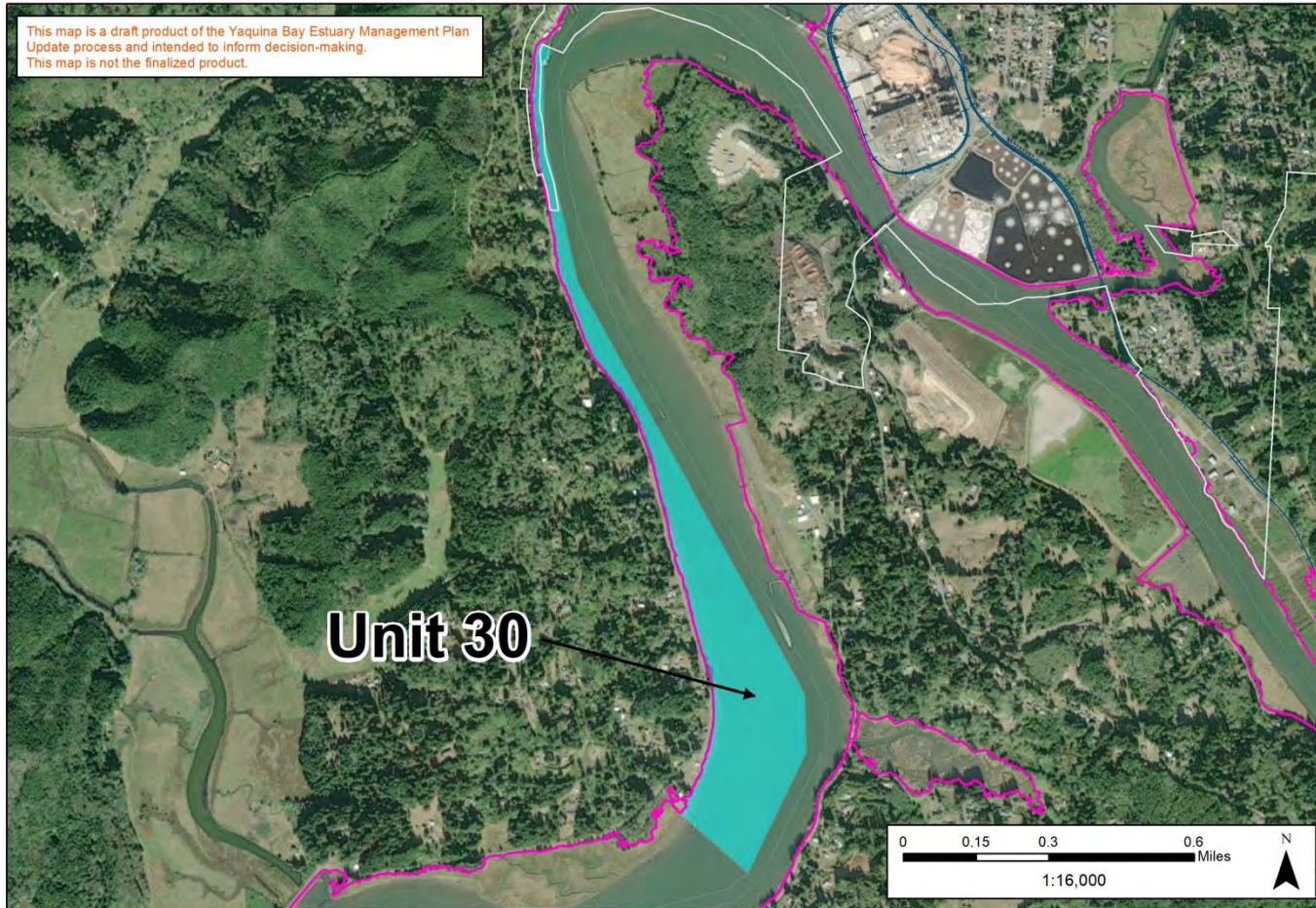
This is a partially altered area and is classified conservation in order to provide for uses that require only minor alterations and are consistent with the conservation of natural resources.

Resource Capability

Unit 30 is an area with a number of alterations, including docks, piers and maintenance dredging at Criteser's Moorage. The area adjacent to Criteser's Moorage is suitable for expansion of water dependent uses. Additional minor structural alterations such as piers, pilings and docks in conjunction with water dependent uses would not have significant adverse effects to the resources of the unit and would be similar to existing development in this area.

Management Objective

Management Unit 30 shall be managed to provide for continuation of existing water dependent uses consistent with the conservation of natural resources.



Estuary Management Unit: 30

Date: 8/24/2023
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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 33. Estuary Management Unit 30, Yaquina Bay

Management Unit 31: YAQUINA BAY

Description

Management Unit 31 consists of the area north of the navigation channel from the Toledo city limits upstream to the mouth of Mill Creek. After RM 14, the north side of MU 31 extends past the navigation channel from river centerline to north shore up to the city of Toledo urban growth boundary (UGB). It includes Depoe Slough up to the tidegate, and Olalla Slough up to and including the railroad bridge (see Figure 34). Natural resources of minor significance present within the unit include some small fringes of tidal marsh, tideflat, spawning and nursery areas and wildlife habitat. Fish migration routes are considered significant. Uses of major significance within the unit include medium draft navigation, the Port of Toledo marina, marine construction and repair operations, including the Port of Toledo shipyard at Sturgeon Bend, and maintenance dredging. The unit has several significant alterations, including bulkheads, pilings, piers, dikes, outfalls, and overhead crossings.

Classification: Development

This is an area of minimal biological sensitivity and is designated development to provide for the continuation of existing uses and for new uses requiring alteration of the estuary.

Resource Capability

Unit 31 fronts the industrialized urban waterfront at Toledo. This is a significantly altered area with numerous established water dependent uses including port facilities, boat building and repair operations and wood products related activities. Biological values in this area are of minor significance. Navigation channel maintenance will protect the migration routes of anadromous fish through this area. Competing uses for the limited surface area of this unit shall be evaluated for compatibility.

Management Objective

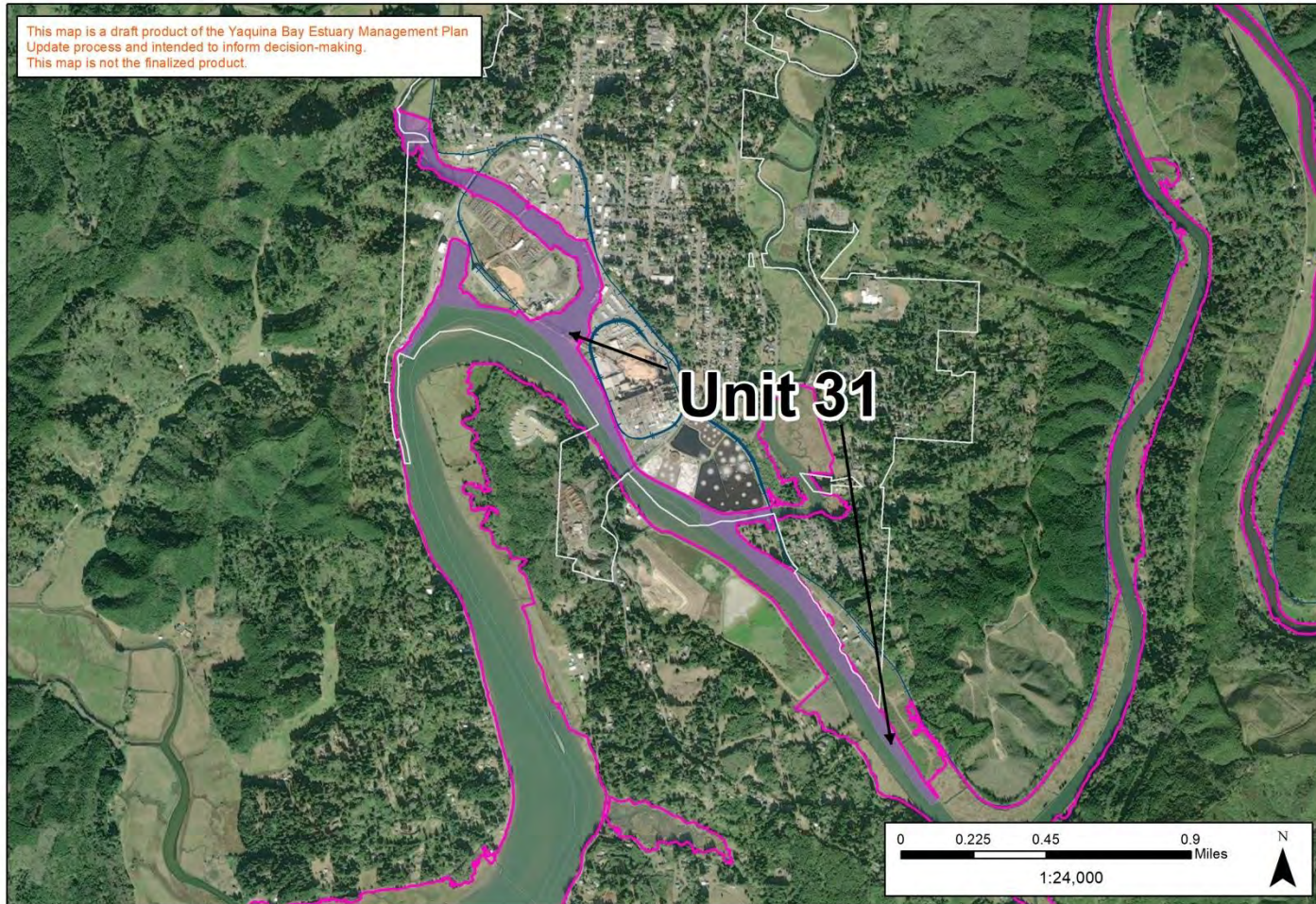
Management Unit 31 shall be managed to provide for continued development of water dependent and water related uses.

Special Policies

1. Expansion or relocation of the City of Toledo's existing sanitary sewer outfall must comply with Department of Environmental Quality requirements.
2. New boat moorage, boat works, boat repair and associated water-dependent and water related commercial and industrial activity will be encouraged on Tokyo Slough, at Sturgeon Bend, and at other locations with direct access to navigable water. Docks for small boats will be allowed consistent with existing development on the urban waterfront

and when compatible with existing large vessel moorage and industrial activity on the river.

3. The Port of Toledo will be encouraged to maintain its existing dock at the foot of Main Street, for transfer of cargo and for boats seeking a downtown moorage.
4. Due to the limited water surface area available and the need for direct land to water access, alternatives (such as mooring buoys and dry land storage) to docks and piers for commercial and industrial uses are not feasible in Unit 31. Multiple use facilities common to several users are encouraged where practical.



Estuary Management Unit: 31

Date: 8/25/2023
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 34. Estuary Management Unit 31, Yaquina Bay

Management Unit 31A: YAQUINA BAY

Description

Management Unit 31A consists of the portion of Olalla Slough upstream of the railroad bridge, extending up to the limit of tidal influence at the Georgia Pacific pumping station and tidegate at SE 10th Street (see Figure 35). Natural resources of significance in the unit include fish migration routes and nursery areas, and a sizable area of tidal marsh totaling approximately 36 acres. This tidal marsh area was formerly blocked from direct tidal inundation by dikes but has been restored to tidal exchange by dike breaching and channel restoration that took place in 2009. Uses in this unit are limited to recreational use, primarily at the City of Toledo's East Slope Park and Glen Lyons Natural Area.

Classification: Natural

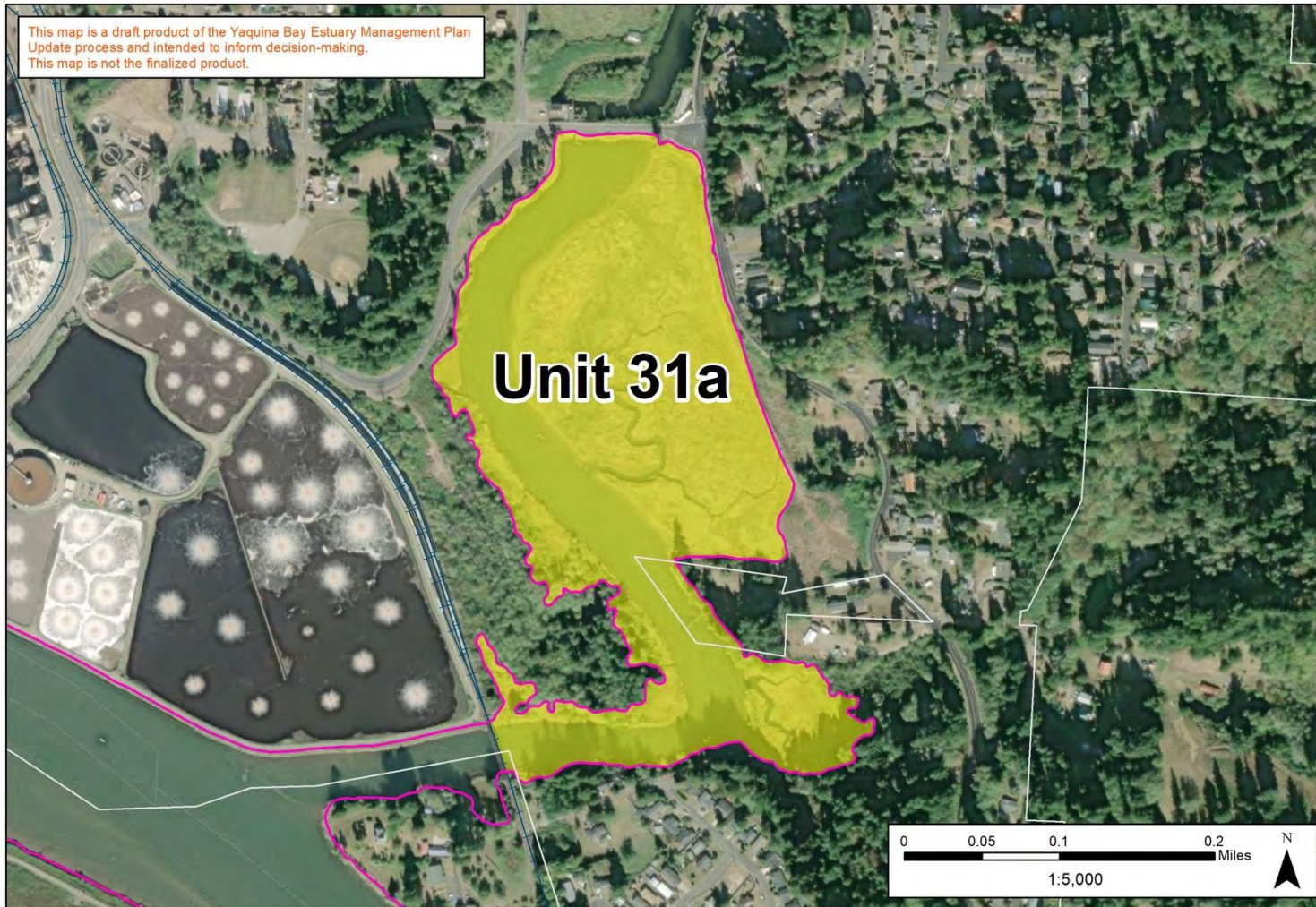
This unit contains a major tract of tidal marsh and has been classified natural in order to preserve and protect natural resources in the unit.

Resource Capability

Management Unit 31A includes areas of restored tidal marsh that were historically diked for agricultural use and largely disconnected from the tidal regime of the estuary. These tracts are now substantially restored to tidal exchange, reestablishing their direct connection to the estuarine system. The restoration of full function of this marsh is ongoing and additional active restoration activities may be undertaken to further enhance the value of these tracts to the estuarine system. Such active restoration activities are consistent with the resource capabilities of this unit.

Management Objective

Management Unit 31A shall be managed to preserve, protect, and enhance natural resources and values.



Estuary Management Unit: 31a

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 35. Estuary Management Unit 31a, Yaquina Bay

Management Unit 32: YAQUINA BAY

Description

Management Unit 32 consists of the area south of the navigation channel from the west Toledo city limits and, after RM 14, the south side extends past the navigation channel upstream to the extent of the Georgia Pacific Toledo landfill (see Figure 36). The unit contains small tracts of marsh, tideflats, and wildlife habitat of minor significance. Major uses within the unit include medium and shallow draft navigation, marine construction and repair operations, and recreational boating and angling. Significant alterations within the unit include bulkheads, pilings, piers, floating docks, dikes and overhead crossings. The unit is considered committed to water-dependent development uses.

Classification: Development

This is an area of minimal biological sensitivity and is needed for uses requiring alteration of the estuary.

Resource Capability

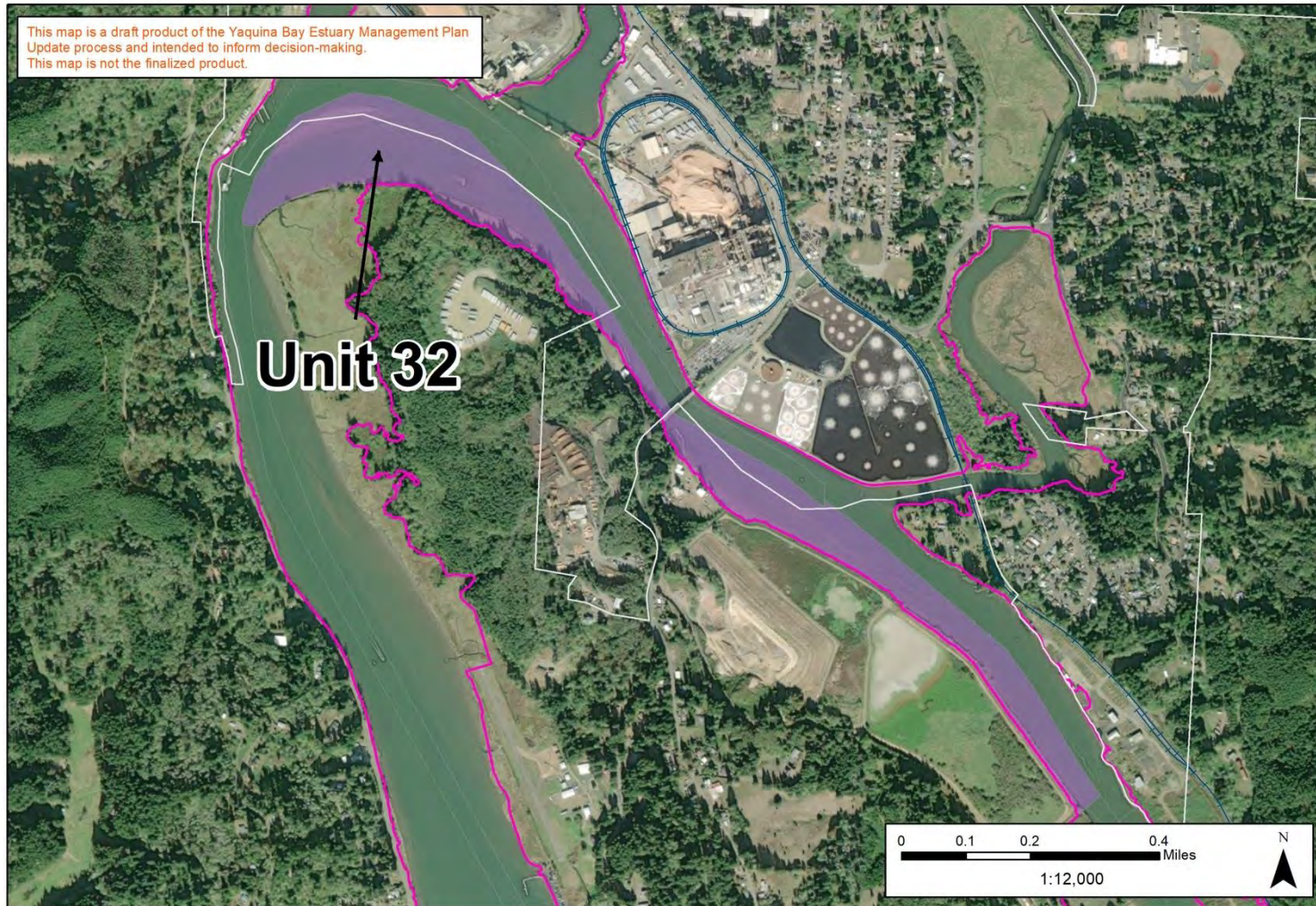
Unit 32 is a partially altered area that borders the south shoreline of the Toledo urban area. Marine construction and repair operations and associated alterations are present in this unit. Additional upland shoreland area is available for water dependent and water related uses and the general range of alterations needed within the adjoining estuary management unit for these uses shall be provided for in this area.

Management Objective

Management Unit 32 shall be managed to provide for water dependent and water related estuarine development.

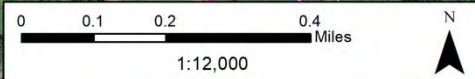
Special Policies

1. Water dependent and water related industrial/commercial uses will be encouraged on coastal shorelands north and south of the Butler Bridge, where city facilities can be made available and access to the navigation channel is convenient.
2. Due to the limited water surface area available and the need for direct land to water access, alternatives (such as mooring buoys and dry land storage) to docks and piers for commercial and industrial use are not feasible in Unit 32. Multiple use facilities common to several users are encouraged where practical.



This map is a draft product of the Yaquina Bay Estuary Management Plan Update process and intended to inform decision-making. This map is not the finalized product.

Unit 32



Estuary Management Unit: 32

Date: 8/24/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

- Natural Units
- Conservation Units
- Development Units
- Estuary Boundary
- City Limits
- Railroad

Figure 36. Estuary Management Unit 32, Yaquina Bay

Management Unit 33: YAQUINA BAY

Description

Management Unit 33 consists of tidal marsh area immediately north of the Toledo Airport. This is a tidal marsh and wildlife habitat of major significance (see Figure 37). No uses are established in this unit at the present time. Alteration of the unit is minimal, with a few pilings present. The northern portion of this unit is an area that has been diked in the past but has largely reverted to tidal marsh due to natural breaches in the dike. Additional dike breaching and ditch filling has been accomplished at this site as part of a restoration project undertaken in 2009.

Classification: Natural

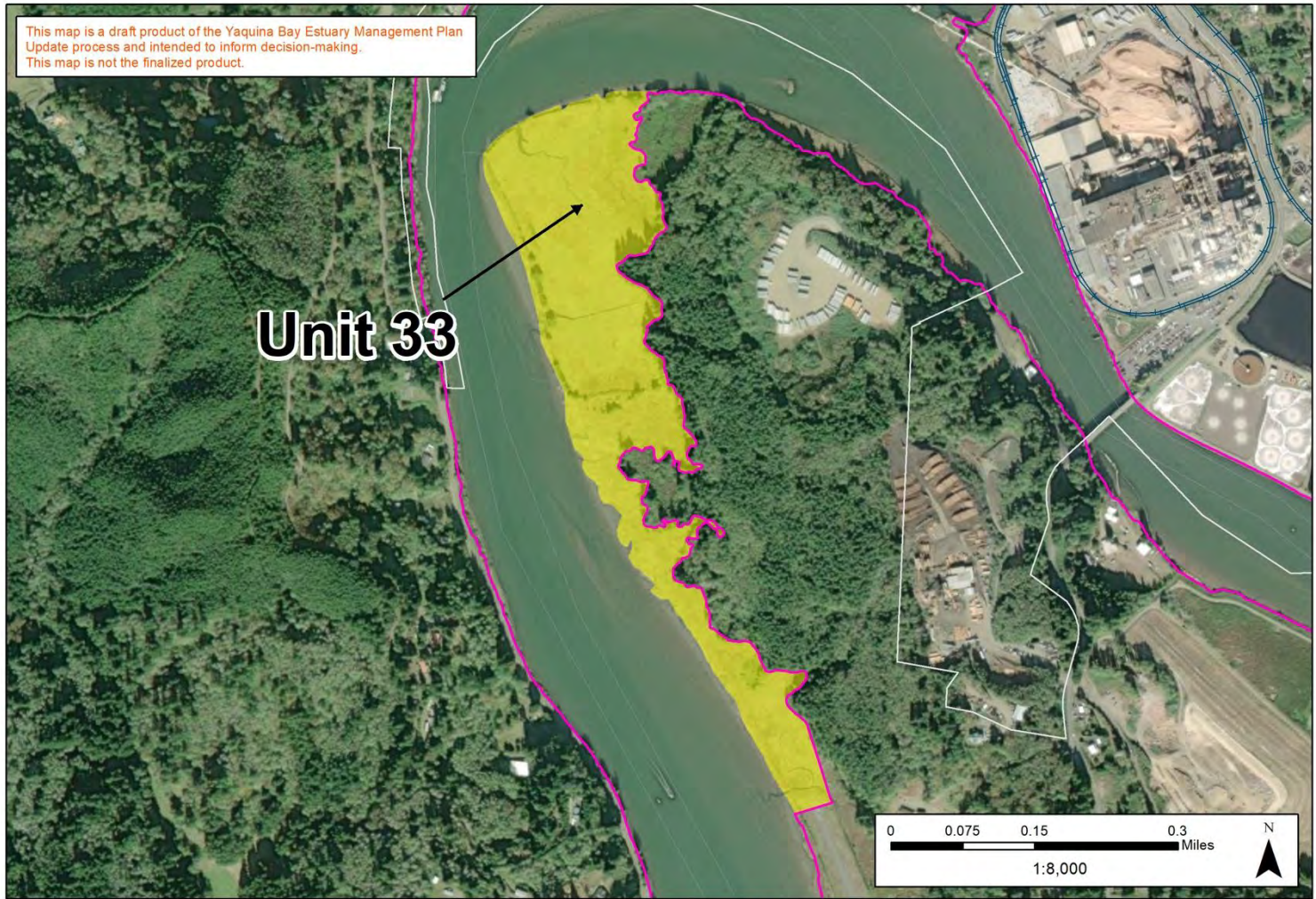
As a major tract of tidal marsh, this area is classified natural to preserve and protect important resource values.

Resource Capability

Unit 33 is a tidal marsh area, portions of which are partially diked. Some pilings and other minor structural alterations are present in the area and have had no apparent adverse effects. Similar minor structures for needed public uses such as navigation aids would be consistent with the area's resource capabilities. The values of the tidal marsh resources of this unit could be enhanced through additional active restoration activities; alterations necessary for active restoration are consistent with the resource capabilities of the area.

Management Objective

Management Unit 33 shall be managed to preserve, protect, and enhance the natural resource values of the productive and significant tidal marsh and wildlife habitat.



Estuary Management Unit: 33

Date: 8/24/2023
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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Legend

 Natural Units	 Estuary Boundary
 Conservation Units	 City Limits
 Development Units	 Railroad

Figure 37. Estuary Management Unit 33, Yaquina Bay

Management Unit 34: YAQUINA BAY

Description

Management Unit 34 includes the entire upper river and associated tidal wetlands from the downstream extent of the Georgia Pacific landfill up to the head of tide at approximately RM 21.8 on the Yaquina River, and approximately RM 4.5 on Big Elk Creek (see Figure 38). Management Unit 34 also includes Mill Creek, up to the head of tide at the confluence of Slack Creek and associated tidal marsh areas. Important natural resources in this unit include marshes, wildlife habitats, and fish spawning and nursery areas. Uses within this unit include shallow draft navigation and recreation. This unit is of special importance as a major sport angling area for anadromous fish. Minimal alterations composed mainly of scattered riprap, dikes and floating docks have occurred in this unit.

Classification: Conservation

This is a partially altered area and is classified conservation in order to provide for uses that require only minor alterations and are consistent with the conservation of natural resources.

Resource Capability

Management Unit 34 includes all of the riverine subsystem of the Yaquina Bay Estuary, as described in the ODFW estuarine habitat classification system. This unit has the character of a tidal river, with very narrow intertidal fringes along the shoreline and a relatively broad channel area. Management recommendations made by ODFW for similar riverine areas suggest that the development of public marinas and boat ramps are consistent with the resource capabilities of the area. Such facilities will serve as an alternative to the proliferation of private docks. Publicly oriented facilities should be reviewed so that they are located only where minor alterations are required (i.e., no major dredge or fill activities). Minor structural alterations such as docks, pilings and piers will not significantly degrade resources in this system.

Management Objective

Management Unit 34 shall be managed to conserve natural resources and values and to provide for low intensity uses which do not require major alterations of the estuary.

Special Policy

1. Individual single purpose docks and piers shall not be permitted in new subdivisions and planned developments. Community facilities common to several users are encouraged.



Estuary Management Unit: 34

Date: 8/25/2023,
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 38. Estuary Management Unit 34, Yaquina Bay

Management Unit 34A: YAQUINA BAY

Description

Management Unit 34A consists of two tracts of restored tidal marsh and intertidal fringe marsh located along the north and west shore, upriver of the STEDCO industrial property and lying between the railroad grade and MLLW (see Figure 39). These tracts of marsh total roughly 77 acres and are currently owned by the Wetlands Conservancy. These areas were blocked from tidal exchange by dikes in the early 20th century and have been restored to the estuary system through dike breaching and channel restoration that began in 2002. These marshes are part of the river sub-system, which is a primarily riverine environment with minimal marine influence. These tidal marshes represent a scarce habitat type in this reach of the estuary and are considered resources of major significance. There are currently no active human uses in this unit.

Classification: Natural

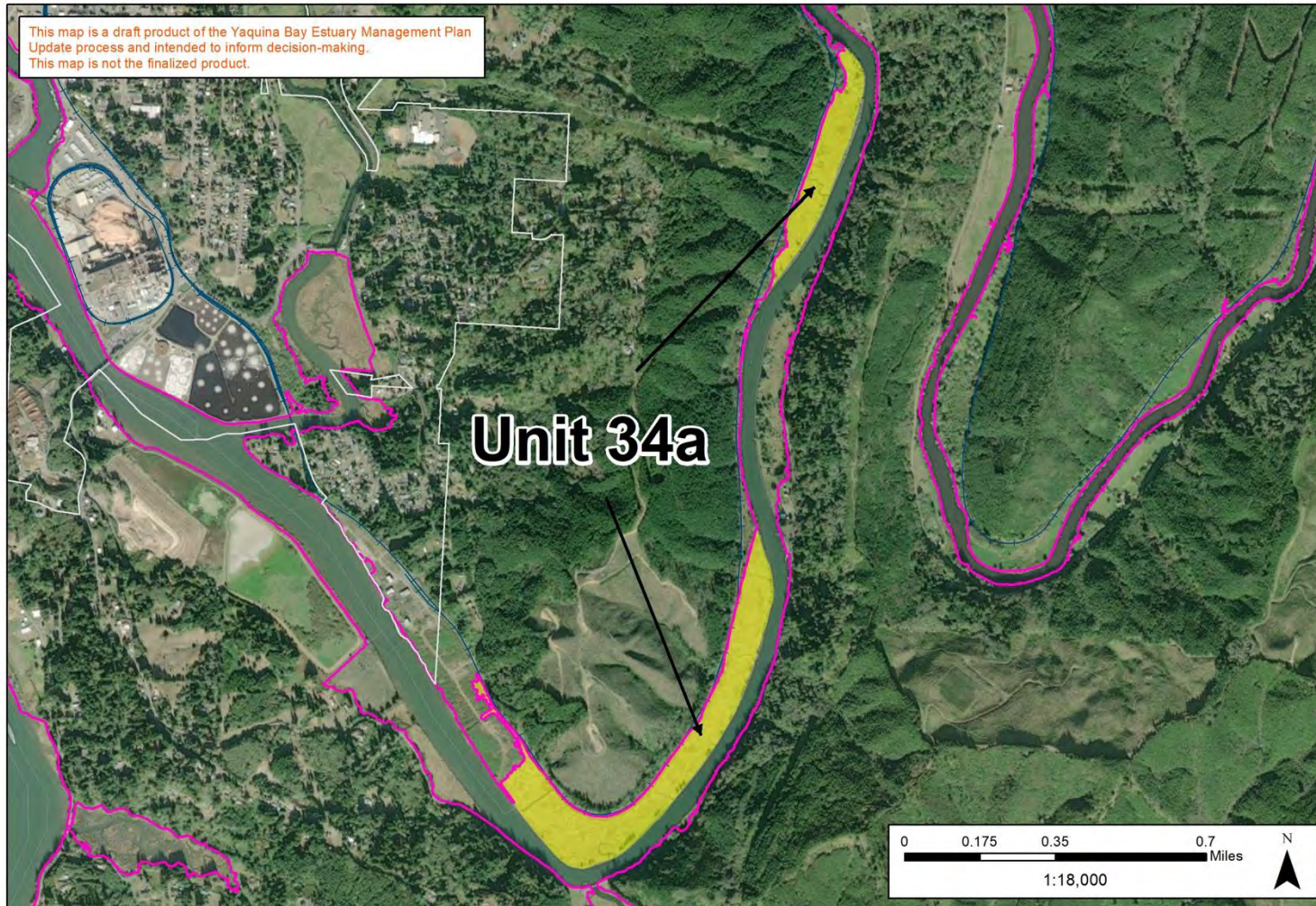
As a major tract of tidal marsh, this unit has been classified natural in order to preserve natural resources in the unit.

Resource Capability

Management Unit 34A is a formerly diked area that was mostly disconnected from the tidal regime of the estuary. These tracts are now largely restored to tidal exchange and thus reconnected to the estuarine system. However, the restoration of full function of this marsh is ongoing and additional active restoration activities may be undertaken to further enhance the value of these tidal wetland tracts to the estuarine system. Such active restoration activities are consistent with the resource capabilities of this unit.

Management Objective

Management Unit 34A shall be managed to preserve and enhance natural resources and values.



Estuary Management Unit: 34a

Date: 8/24/2023
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - Railroad

Figure 39. Estuary Management Unit 34a, Yaquina Bay

Management Unit 34B: YAQUINA BAY

Description

Management Unit 34B consists of a tract of tidal marsh and intertidal fringe at approximately RM 16.5, just upriver from Cannon Quarry County Park. It lies between Elk City Road (County Road 533) and MLLW. This tract of marsh totals approximately 22 acres, roughly 14 acres of which are currently owned by the Wetlands Conservancy. This marsh is part of the river sub-system, which is a primarily riverine environment with minimal marine influence. This tract is an example of a tidal swamp (forested and scrub/shrub tidal wetland), a plant community that is a scarce habitat type in the Yaquina estuary. It is therefore considered a resource of major significance. There are currently no active human uses in this unit.

Classification: Natural

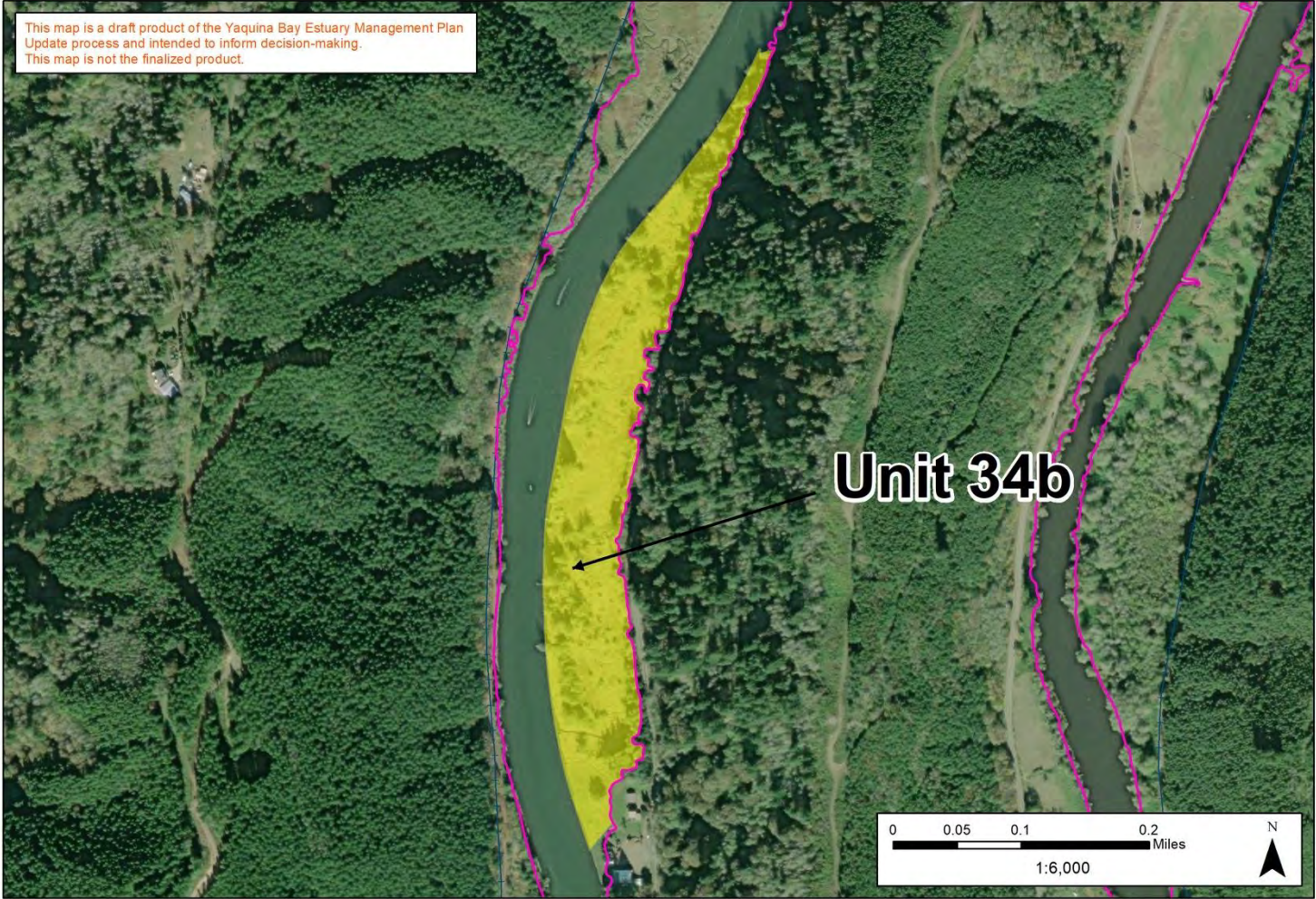
As a major tract of tidal marsh, this unit has been classified natural in order to preserve natural resources in the unit.

Resource Capability

Management Unit 34B is a tidal swamp, a portion of which is in conservation ownership. Though currently undiked and open to tidal exchange, active restoration activities may be appropriate to further enhance the value of this tract to the estuarine system. Such active restoration activities are consistent with the resource capabilities of this unit.

Management Objective

Management Unit 34B shall be managed to preserve and enhance natural resources and values.



Estuary Management Unit: 34b

Date: 8/25/2023
 Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Lincoln County, "YEMP_MUs", (2023)

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- Legend**
- Natural Units
 - Conservation Units
 - Development Units
 - Estuary Boundary
 - City Limits
 - + Railroad

Figure 40. Estuary Management Unit 34b, Yaquina Bay

PART VII - MITIGATION AND RESTORATION

Proposed revisions as part of the 2023 update

Lincoln County estuaries have been substantially altered over the past century to provide for navigation, shoreline development and agriculture. Upriver watershed activities have also contributed significantly to changes in the natural functioning of the estuaries. Estuaries provide important benefits—called ecosystem services—that impact our day-to-day lives. In addition to their natural beauty, they support clean water, abundant wildlife, and recreation. They also protect homes, businesses, and infrastructure from the impacts of flooding and climate change. Therefore, restoration of estuarine resources and habitat is critical to support sustainable fisheries, recover threatened and endangered species, clean water, store carbon, and increase the resilience of coastal communities. Additionally, new development projects in estuarine areas will have some adverse environmental and social impacts, regardless of how carefully the projects are designed and planned. The adverse effects of such development can be compensated for (or mitigated) by the creation, restoration or enhancement of other estuarine areas.

Relationship of Restoration and Mitigation

Restoration is defined for purposes of Statewide Planning Goal 16 and this Estuary Management Plan as follows:

"Restoration means to revitalize or reestablish functional characteristics and processes of the estuary diminished or lost by past alterations, activities, or catastrophic events. A restored area must be a shallow subtidal or an intertidal or tidal marsh area after alteration work is performed and may have not been a functioning part of the estuarine system when alteration work began."

Examples of estuarine restoration projects include removing fills; marsh creation; breaching dikes or removing tidegates to restore or improve tidal exchange; and dredging and construction measures to re-establish former depths, shoreline configurations and flushing and circulation patterns.

For purposes of this Plan, mitigation refers specifically to offsetting or compensating for adverse impacts of dredging and filling in intertidal or tidal marsh areas through creation, restoration and enhancement of estuarine areas. Mitigation is defined in Statewide Planning Goal 16 as *"the creation, restoration or enhancement of an estuarine area to maintain the functional characteristics and processes of the estuary, such as its natural biological productivity, habitats and species diversity, unique features and water quality."*

It is important to note the limited meaning of the term “mitigation” as defined in the Statewide Planning Goals. For Goal 16 purposes, mitigation refers *only* to compensatory measures to offset the impacts of dredge or fill in intertidal or tidal marsh area. In contrast, in state and federal regulatory processes, mitigation has a more expansive definition, and generally refers to project design features or other measures that serve to avoid, reduce, or compensate for adverse impacts of any type of aquatic area alteration. In the estuary management plan, mitigation is given its more limited meaning in accordance with Goal 16.

Restoration and mitigation are related in that certain restoration activities can serve as mitigation for adverse impacts of development. For example, restoration of a diked tidal marsh to full tidal exchange by removing or breaching the dike could serve as mitigation for filling a tidal marsh area for water dependent development.

Statewide Planning Goal 16 has explicit requirements concerning mitigation. Implementation requirement 5 states:

"When dredge or fill activities are permitted in intertidal or tidal marsh areas, their effects shall be mitigated by creation, restoration, or enhancement of another area to ensure that the integrity of the estuarine ecosystem is maintained. Comprehensive plans shall designate and protect specific sites for mitigation which generally correspond to the types and quantity of intertidal area proposed for dredging or filling or make findings demonstrating that it is not possible to do so."

Implementation of the Goal 16 compensatory mitigation requirement for intertidal dredge or fill is the responsibility of the Department of State Lands (ORS 196.830). The Oregon Removal-Fill Law (ORS 196.795-990) provides the Department of State Lands (DSL) with the authority to require mitigation for dredging or filling waters of the state. For estuarine areas, DSL must require mitigation for alteration of intertidal and tidal marsh areas as required by Goal 16. DSL may require mitigation for removal and/or fill actions in subtidal areas, and all areas in the estuary below highest measured tide. Applications for alterations of intertidal and tidal marsh areas are reviewed by local jurisdictions. If such alterations are permissible or conditionally permitted based on the type of alteration and the Management Unit's classification and special policies, then the application is raised to DSL's review. DSL coordinates permit issuance and mitigation requirements with affected local, state, and federal agencies. The need for mitigation is determined through the state permitting process with the type and amount of mitigation determined via the eligibility and accounting process.

Overall Restoration Policy

All restoration projects should serve to revitalize, return, replace or otherwise improve estuarine ecosystem characteristics. Examples include restoration of biological productivity, fish or wildlife habitat, other natural or cultural characteristics or resources, or ecosystem services that have

been diminished or lost by past alterations, activities or catastrophic events. In general, the Lincoln County Estuary Management Plan shall provide for and facilitate the beneficial restoration of estuarine resources and habitats, consistent with Statewide Planning Goal 16.

Restoration Needs

Yaquina Bay

Past alterations in the Yaquina Bay estuary have resulted in the loss of several resources and habitat types. For example, there are the numerous filled-in estuarine areas (253 acres total) which have resulted in the loss of nearly 200 acres of intertidal area, or about 14% of the total tidelands within the bay. The other major alteration that has resulted in significant habitat and resource loss has been the extensive diking and/or filling of tidal marsh areas. Tidal marsh is a relatively scarce habitat type within Yaquina Bay that provides vitally important primary productivity habitat for salmon and other species, and a host of other ecosystem services. With a total area of slightly less than 4,000 acres, Yaquina Bay contains only 819 acres of tidal marsh. Some tidal marsh areas have been filled for development or used as dredged material disposal sites. Others have been diked and closed off from tidal exchange, primarily for use as pasture.

The opportunities for the restoration of tideland area within Yaquina Bay are extremely limited. Nearly all of the filled areas have been developed for commercial or industrial uses, making any major fill removal impractical. Some small sites may be suitable for the restoration of limited intertidal areas.

By far the most prevalent and practical restoration opportunities in Yaquina Bay involve marsh creation/restoration. Extensive areas of diked or semi-diked marsh exist in the middle and upper portions of the estuary; a number of these areas have the potential to be restored to productive tidal marshes. Lastly, many of the habitats and fauna native to Yaquina Bay that restoration activities seek to preserve or re-establish, such as native oysters or eelgrass, can move over time.

Restoration Sites

Considerable work has been done by agencies, academia, and conservation interests in identifying and assigning priorities to restoration opportunities in Yaquina Bay. The reports that have been produced from this work generally serve the purpose of guiding agency and conservation group strategic plans for restoration, and prioritizing individual restoration projects. While prioritizing or initiating restoration projects is not within the scope or purpose of the estuary management plan, the new information generated from these reports provides an excellent baseline for the identification of restoration sites required by Goal 16 (implementation requirement 8).

For purposes of establishing the inventory of estuarine restoration sites for Yaquina Bay required by Goal 16, the following publications constitute the primary sources of information:

1. Lincoln County. 1982. **Lincoln County Estuary Management Plan.**
2. Brophy, L.S. 1999. **Final Report: Yaquina and Alsea River Basins Estuarine Wetland Site Prioritization Project** (for the MidCoast Watersheds Council).
3. Brophy, L.S. 2012. **Tidal Wetlands of the Yaquina and Alsea River Estuaries, Oregon: Geographic Information Systems Layer Development and Recommendations for National Wetlands Inventory Revisions. USGS Open-File Report 2012-1038. U.S. Dept. of the Interior, U.S. Geological Survey**
4. Oregon Central Coast Estuary Collaborative. 2022. **Restoring Resilience in Two Estuaries** (A Focused Investment Partnership Application to Oregon Watershed Enhancement Board).

The list of potential restoration sites documented in these publications is incorporated into the comprehensive plan inventory and constitutes the identification of areas for restoration as required by Goal 16, implementation requirement 8. These reports also establish a priority ranking of the identified sites intended to help guide the decisions of entities that initiate and fund restoration projects. However, these rankings are not incorporated into the Estuary Management Plan (EMP), and these priorities are not a factor in the evaluation of proposed restoration activities subject to review under the EMP.

The list of potential restoration sites adopted as a part of the plan inventory is not necessarily all-inclusive, and should not be construed to preclude any other site from consideration for restoration that is otherwise consistent with the requirements of the EMP. For instance, the primary sources for this list have not explicitly evaluated or prioritized areas currently defined as shoreland that, due to projected sea level rise, may become potential restoration sites or tidal marsh through landward migration.

Mitigation

The mitigation provisions of Goal 16 require that appropriate sites be designated to meet anticipated needs for estuarine resource replacement required to compensate for dredge or fill in intertidal or tidal marsh areas. These sites are to be protected from uses that would preempt their availability for required mitigation activities. Mitigation sites have been selected from among the restoration sites identified in the preceding discussion. All of these sites have been evaluated as potential mitigation sites based on the following criteria:

1. **Biological Potential:** Sites have been evaluated in terms of their similarity of habitat to areas likely to be altered or destroyed by future development activities; or, alternatively, sites were chosen which may provide resources that are in greatest scarcity compared to their past abundance or distribution. This

evaluation has been based on an analysis of each site relative to a general assessment of probable foreseeable mitigation needs in each estuary, as well as past alterations or losses.

2. Engineering or Other Technical Constraints: Sites have been evaluated in terms of the type and magnitude of technical limitations that need to be overcome to accomplish restoration or enhancement. Sites with fewer constraints were considered more appropriate for use as mitigation sites.
3. Present Availability: The probable availability of each site during the original planning period has been evaluated. This evaluation was based primarily on the presence or absence of existing conflicting uses and ownership factors that might influence availability (e.g., public versus private ownership).
4. Feasibility of Protecting the Site: An assessment of each site has been done to determine the likelihood that an overriding need for a preemptive use will arise during the planning period. Sites for which no conflicting uses are anticipated are considered most desirable from the standpoint of ensuring future availability through protective zoning or other means.

Mitigation Needs and Sites

Yaquina Bay

Future mitigation needs in Yaquina Bay will most likely be generated by dredge and fill activities in intertidal flat areas in the Newport and Toledo sub-areas and possibly in the Yaquina sub-area.

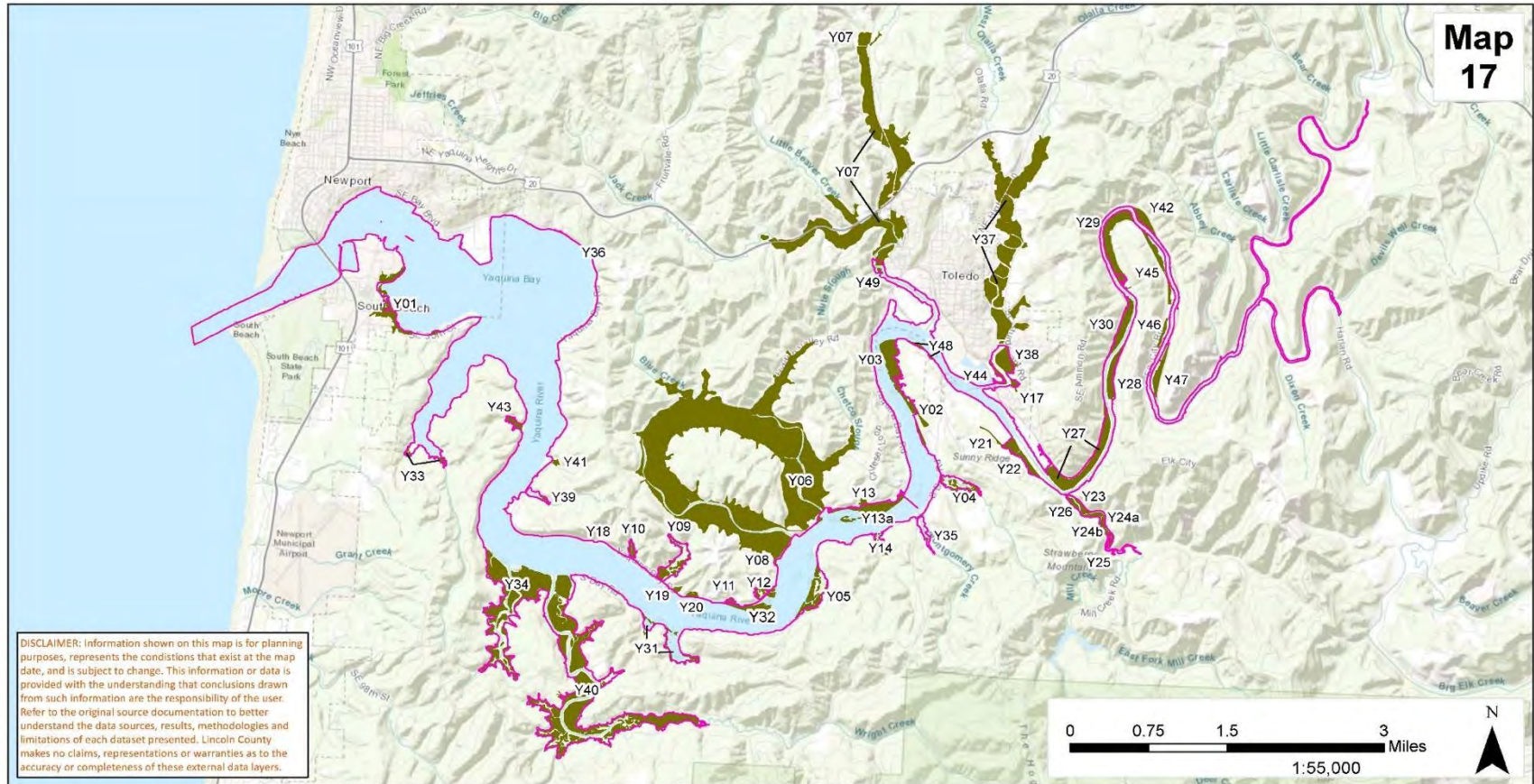
Almost all of the tidal marsh areas in Yaquina Bay are protected by Natural Management Unit designations, so projects involving dredge and/or fill in tidal marsh areas are unlikely. One notable exception is the proposed aquaculture development at Poole's Slough (see Goal Exceptions, Appendix C). This project would involve fill and removal in a tidal marsh area and appropriate mitigation would be required.

As described in the discussion of restoration needs and sites, opportunities for restoration or enhancement in intertidal flat or shore areas in Yaquina Bay appear to be very limited. For this reason, the mitigation sites listed below were selected for the opportunities they provide for restoration primarily of tidal marsh, a historically diminished resource. The matching of sites to individual dredge or fill projects will be accomplished as part of the DSL Removal-Fill permit process.

While it is not possible to precisely estimate and quantify the amount of mitigation that will be needed during the planning period, it was determined that the sites listed below represent sufficient biological potential to compensate for the general range and extent of anticipated intertidal dredge and fill activities in Yaquina Bay.

It is important to note that the identification and protection of the following sites is intended to reserve a supply of sites and ensure their availability for estuarine resource replacement as required by Goal 16. This list in no way precludes the use of other appropriate sites or actions to fulfill Goal 16 mitigation requirements as determined by the Department of State Lands. The sites have been identified in Dr. Brophy's 1999 paper (see the 2nd source listed for restoration sites as described above) and the site numbers correspond to the sites visualized in Figure 2 (below) Restoration Sites (Map Inventory #17).

Site # (Brophy, 1999)	Protective Mechanism
Y18	Coastal Shorelands (C-S) Overlay (significant wetland)
Y19	Estuary Management Unit (16)
Y20	C-S Overlay (significant wetland)
Y11	Estuary Management Unit (23)
Y30	C-S Overlay (significant wetland)
Y31	Estuary management Unit (21)
Y6	C-S Overlay (significant wetland)



Restoration Sites

See reports cited below for descriptions of each restoration site.

Date: 5/30/2023, Projection: NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl
 Data Source: Brophy, L.S. 2012. Tidal Wetlands of the Yaquina and Alsea River Estuaries, Oregon: Geographic Information Systems Layer Development and Recommendations for National Wetlands Inventory Revisions. USGS Open-File Report 2012-1038. U.S. Dept. of the Interior, U.S. Geological Survey.
<https://pubs.usgs.gov/of/2012/1038/methods.html>

This map is a draft interim product of the Yaquina Bay Estuary Management Plan Update process intended to inform decision-making. This map is not the finalized product.

Data Source: Brophy, L.S. 1999. Final report—Yaquina and Alsea River Basins estuarine wetland site prioritization project. Report prepared for the MidCoast Watersheds Council, Newport, Oregon, Green Point Consulting, Corvallis, Oregon, 50 p.
<https://doi.org/10.13140/RG.2.2.26654.20803>

Legend

Restoration Sites Estuary Boundary

Data Source: Brophy L.S., Greene C.M., Hare V.C., Holycross B., Lanier A., Heady W.N., O'Connor K., Imaki H., Haddad T., and Dana R. 2019. Insights into estuary habitat loss in the western United States using a new method for mapping maximum extent of tidal wetlands. PLOS ONE 14(8): e0218558.
<https://doi.org/10.1371/journal.pone.0218558>.

Figure 41. Restoration Sites

PART VIII – (REMOVED) LOG STORAGE & TRANSPORTATION

Proposed revisions as part of the 2023 update

This Plan Part has been removed as part of the 2023 update. A Needs & Gaps Assessment was performed to recommend updates to the Plan. The below text from the Assessment describes the cause for the removal of the Plan Part.

"In the forty some years since this element of the YBEMP was developed, much has changed in the wood products industry. Of the six mills that were operating on Yaquina Bay in the early 1980s, only one remains in operation, the Georgia-Pacific paper mill in Toledo. The two mills that were still utilizing in-water log storage at that time both ceased operations more than three decades ago. Currently, no in-water log storage or transportation is conducted in Yaquina Bay. Most of the associated infrastructure (pilings and dolphins) is in a deteriorated state. Given current technology and foreseeable market conditions, it is not anticipated that there will be any future demand for the storage or transport of raw logs in the estuary. Given these factors, it is concluded that Part VIII is no longer relevant to the management of future use of the Yaquina Bay estuary."

-Page 26 of the Yaquina Bay Estuary Management Plan Needs & Gaps Assessment

PART IX – (REMOVED) FUTURE DEVELOPMENT SITES

This Plan Part was not updated as part of the 2023 update. It is not regulatory, is obsolete, and was not used in current decision making. This Plan Part and its accompanying Management Unit special policies Management Units have been removed to avoid confusion.

A Needs & Gaps Assessment was performed in 2023 to recommend updates to the Plan. Plan Part IX – Future Development Sites was recommended to be updated sometime in the future if economic conditions warranted development beyond in-fill redevelopment. The below text from the Assessment describes why this specific Plan Part was not updated.

"The identification of potential sites for redesignation to accommodate future development needs is not required by Goal 16. This analysis was included in the original YBEMP in recognition that areas within the estuary qualifying for development management unit designation were largely fully developed at the time the plan was completed, and that accommodating additional major development could require the redesignation of areas currently designated *natural* or *conservation*."

Part IX does not provide binding policy and is thus primarily an attempt to provide general guidance for future deliberations on redesignation. Because the analysis of future development needs is based on economic and market forecasts from the late 1970s, Part IX is currently obsolete. Adding to that obsolescence are the significant changes in applicable state and federal environmental standards since Part IX was adopted. Given these current standards, the likelihood is remote that a number of the identified potential future development sites could secure necessary regulatory approvals for development. Part IX is therefore of limited utility as presently formulated."

-Page 27 of the Yaquina Bay Estuary Management Plan Needs & Gaps Assessment

PART X - PLAN IMPLEMENTATION

Proposed revisions as part of the 2023 update

The Lincoln County Estuary Management Plan is implemented at the local level by the units of local government with comprehensive planning and zoning responsibilities, i.e., Lincoln County and the cities of Newport and Toledo. Relevant portions of the management plan are adopted as an element of the applicable local comprehensive plans.

Local Land Use Regulation Requirements

To implement the policies and standards of the estuary management plan, city and county land use regulations shall, at a minimum:

- Specify permissible uses for individual management units consistent with the Management Classification requirements of Part IV;
- Provide for the application of review standards set forth in Part II, Part IV and Part V in accordance with applicable procedural requirements; and
- Establish a requirement to assess the impacts of proposed estuarine alterations in accordance with Statewide Planning Goal 16, implementation requirement 1 and Part II of this plan.

Impact Assessment Requirements

As set forth in Part II, unless fully addressed elsewhere in this plan, actions that would potentially alter the estuarine ecosystem shall be preceded by a clear presentation of the impacts of the proposed alteration. Impact Assessments are required for dredging, fill, in-water structures, shoreline protective structures including riprap, log storage, application of pesticides and herbicides, water intake or withdrawal and effluent discharge, flow lane disposal of dredged material, and other activities that could affect the estuary's physical processes or biological resources.

The Impact Assessment requirement does not by itself establish any approval threshold related to impacts. The purpose of the Impact Assessment is to provide information to allow local decision makers and other reviewers to understand the expected impacts of proposed estuarine alterations, and to inform the application of relevant approval criteria (e.g., consistency with resource capabilities).

The Impact Assessment need not be lengthy or complex. The level of detail and analysis should be commensurate with the scale of expected impacts. For example, for proposed alterations with minimal estuarine disturbance, a correspondingly simple assessment is sufficient. For alterations with the potential for greater impact, the assessment should be more comprehensive. In all cases, it should enable reviewers to gain a clear understanding of the impacts to be expected. The Impact Assessment shall be submitted in writing to the local jurisdiction and include information on:

1. The type and extent of alterations expected;
2. The type of resource(s) affected;

3. The expected extent of impacts of the proposed alteration on water quality and other physical characteristics of the estuary, living resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary;
4. The expected extent of impacts of the proposed alteration must reference relevant Climate Vulnerabilities as described in applicable sub-area(s) for the management unit(s) where the alterations are proposed (applicants are encouraged to document the use of any applicable data and maps included in the inventory such as sea level rise and landward migration zones) when considering future:
 - a. long term continued use of the proposed alteration
 - b. water quality and other physical characteristics of the estuary,
 - c. living resources,
 - d. recreation and aesthetic use,
 - e. navigation, and
 - f. other existing and potential uses of the estuary;
5. The methods which could be employed to avoid or minimize adverse impacts; and
6. References, information, and maps relied upon to address (1) through (5) above.

Local Review Procedures

Statewide Planning Goal 16 establishes a number of discretionary standards that apply to the review of proposed estuarine development activities. These include certain management unit requirements (e.g., resource capability test) and the provisions of implementation requirement 2. These standards are in turn incorporated into this estuary management plan, specifically in Parts II, IV, V, VI.

County or city approval of estuarine alterations subject to one or more discretionary review criteria is a “permit” as defined in ORS 215 and ORS 227 and subject to the procedural requirements of ORS 215.402 to 215.438 (county) or ORS 227.160 to 227.186 (cities). In compliance with statutory procedural requirements, all proposals for estuarine alterations subject to Goal 16, Implementation Requirement 2, or subject to findings of consistency with the resource capabilities of the area, shall be reviewed in accordance with either Type II procedure (decision without a hearing subject to notice), or Type III procedure (public hearing), as specified in the applicable jurisdiction’s land use regulations.

State and Federal Regulation

Most development activities in estuarine aquatic areas are subject to regulation by one or more state and federal agencies. These regulatory requirements derive from state and federal statutes, and these authorities are discrete and independent from the provisions of the Estuary Management Plan. State and federal regulatory requirements are therefore additive to the policies and implementation requirements of the Estuary Management Plan. That is, the authorization of uses and activities by this estuary management plan and implementing local land use regulations does not remove the requirement for applicants to comply with applicable state and federal regulatory requirements. Likewise, state and/or federal approvals of estuarine development activities do not supersede or pre-

empt the requirements of this plan and implementing regulations. While state and federal permitting agencies do not have jurisdictional authority or responsibility to directly implement the management plan, under state agency coordination and federal consistency requirements, agency regulatory actions must be compatible with the plan and statewide planning goals. More detailed discussion of this coordination relationship between the management plan and state and federal regulatory programs is provided in the subsections below.

Though state and federal regulations are not directly part of the management plan, a basic knowledge of the principal regulatory programs is useful in understanding the multi-jurisdictional regulatory environment for estuarine development. The following state and federal regulatory authorities are summarized in general terms to assist users of this plan in identifying the basic processes involved in the regulation of estuarine development. For detailed information regarding these regulatory programs, users should contact the appropriate agency.

Federal Permits

The principal federal authorizations required for estuarine development activities are Department of the Army permits administered by the US Army Corps of Engineers. Under Section 10 of the Rivers and Harbors Act, a Corps permit is required prior to any work in or over navigable waters of the United States, or work which affects the course, location, condition or capacity of such waters. Projects typically requiring Section 10 permits include construction of piers, wharves, bulkheads, dolphins, marinas, ramps, floats, intake structures, cable, or pipeline crossings, including overhead transmission lines and tunnels, and dredging and excavation. Under Section 404 of the Clean Water Act, a Corps permit is required prior to the discharge of dredged or fill material into the waters of the United States.

Many projects that require a Corps Section 10 and/or Section 404 permit also require evaluation under other related federal laws and regulations. These include, but are not limited to:

- Section 401 of the Clean Water Act
The Clean Water Act (CWA) gives states (Oregon DEQ) the authority to grant, deny, or waive certification of proposed federal licenses or permits that may discharge into waters of the United States. Under Section 401 of the CWA, the Corps may not issue a permit or license to conduct any activity that may result in any discharge into waters of the United States unless a Section 401 water quality certification is issued, or certification is waived.
- Endangered Species Act/Magnuson-Stevens Act
When a proposed project will affect a species listed under the Endangered Species Act, the Corps is required to consult with the National Marine Fisheries Service (NMFS) and/or the US Fish and Wildlife Service (USFWS), and cannot issue a permit until that consultation is complete. The NMFS consults on salmon, marine fish, marine mammals and marine reptiles. The USFWS consults on birds, terrestrial animals, plants, amphibians and most freshwater fish.
- National Historic Preservation Act - Cultural Resources and Historic Properties
In reviewing and issuing permits, the Corps is required to comply with Section 106 of the National Historic Preservation Act of 1966, which requires federal agencies to take into account the effects of their undertakings on historic properties. Historic properties, commonly referred

to as cultural resources, are archaeological sites, historic districts, buildings or structures, and traditional cultural properties that are included in the National Register of Historic Places, or meet the criteria for inclusion in the National Register. The term encompasses artifacts, records and human burials related to and located within such properties.

- Federal Trust Responsibilities

The federal government's unique relationship with Native American tribes is embodied in the U.S. Constitution, treaties, court decisions, federal statutes and executive orders. Native American treaties protect and preserve land and certain rights retained by the tribes when they sign treaties. Treaties with tribes are binding, enforceable, and share a level of supremacy comparable to federal laws passed by Congress. As a federal agency, the Corps has federal trust responsibility to ensure that the rights of federally recognized tribes are not compromised as part of permit decisions.

State Permits

There are several state regulatory programs that require approvals prior to undertaking certain estuarine developments and activities. Among these programs are the following:

Removal-Fill Permits

Oregon's Removal-Fill Law ([ORS 196.795-990](#)) requires a permit to remove or fill material in wetlands or waterways. The Removal-Fill permit process is administered by the Oregon Department of State Lands (DSL). Many proposed estuarine development projects will require both a Removal-Fill permit and a Corps Section 10/Section 404 permit, along with a Section 401 water quality certification. To simplify the application process for projects that require both a Removal-Fill and Corps permit, DSL, DEQ and the Corps have established a joint permit application (JPA). The JPA allows an applicant to submit a single unified application to all three agencies simultaneously.

An important component of the Removal-Fill permit in estuaries is the estuarine resource replacement requirement of ORS 196.830. This codifies DSL's authority to implement the compensatory mitigation requirements of Goal 16, Implementation Requirement 5.

In making decisions on Removal-Fill permits, DSL consults with other agencies that have responsibilities for and/or expertise in the management of aquatic resources. These include:

- Oregon Department of Fish and Wildlife (ODFW)
In the Removal-Fill permit process, ODFW serves as a consultant to DSL on all matters related to fish and wildlife habitat. In the review of Removal-Fill permits, ODFW provides input on ways to minimize impacts on fish and wildlife habitat, specifies the timing of in-water work, assures compliance with fish passage requirements, and provides related guidance for the protection of fish and wildlife resources.
- Oregon Department of Environmental Quality (DEQ)
In the Removal-Fill Permit review process, DEQ serves as a consultant to DSL on all matters related to water quality. In addition to its responsibility to issue Section 401

water quality certification for Corps permits, DEQ may also provide input to DSL about the potential water quality effects of a proposed removal-fill project. DEQ issues stormwater (NPDES) permits that are frequently required for removal-fill related activities, and DEQ administers the Total Maximum Daily Load (TMDL) standards for water quality, which are considered in the removal-fill permit process.

- Oregon Water Resources Department (OWRD)
OWRD may review applications for water storage or uses that appropriate water and require a water right from OWRD.
- Oregon State Marine Board (OSMB)
If a proposed project involves a dock or other structure in the waterway, OSMB may provide input to DSL to address navigation access and safety requirements.

Waterway Authorizations

The Department of State Lands (DSL) issues several types of proprietary authorizations required for the use of state-owned submerged and submersible land. The uses subject to these authorizations typically involve various types of in-water structures or other uses or activities that occupy waterway surface area. These authorizations include leases for commercial or larger private structures, licenses for certain public uses, easements for utility and infrastructure improvements, and registrations for smaller, private use structures.

Commercial Shellfish Plats

Under ORS 622, the Oregon Department of Agriculture (ODA) is the state authority for issuing leases of state owned submerged or submersible lands for the commercial cultivation of clams, mussels and oysters. These leases, referred to as oyster plats, are issued only in areas where water quality has been certified by ODA as suitable for the production of shellfish for human consumption.

State and Local Coordination

Under ORS Chapter 197, state agencies are required to conduct their activities (including the issuance of permits and other authorizations) in a manner that complies with the statewide planning goals and is compatible with local comprehensive plans and land use regulations. To address this requirement, each state agency has developed and adopted a state agency coordination (SAC) program that has been approved by the Land Conservation and Development Commission. The SAC sets forth the procedures each agency will employ to assure that agency actions comply with the statewide planning goals and are compatible with local plans and regulations.

For state agencies with regulatory authority over estuarine development, the primary mechanism for ensuring compatibility with local estuary plan requirements is the Land Use Compatibility Statement (LUCS). Applicants for Removal-Fill permits, waterway authorizations, water quality certifications and most other state agency authorizations are required to obtain from the local land use authority a LUCS that certifies that the proposed use or activity complies with local land use requirements or that specifies local land use approvals are required to establish compliance. In general, state agencies will

not begin their permit review until compatibility with local planning requirements is certified by the local jurisdiction.

Federal Consistency

The Coastal Zone Management Act of 1972 provides for “federal consistency,” a requirement that federal agency actions (including the issuance of federal permits and licenses) within the coastal zone must be consistent with a state’s federally approved coastal management program. All of Oregon’s estuarine areas are within the coastal zone jurisdiction of the Oregon Coastal Management Program (OCMP), thus Corps and other federal permits required for estuarine development are subject to federal consistency requirements.

The OCMP is comprised of a network of state and local authorities that includes city and county comprehensive plans and land use regulations. In general, most of the substantive provisions of the estuary management plan are incorporated into the OCMP as “enforceable policies” applicable to federal consistency reviews. In short, this means that federal permits and licenses (e.g., Corps permits) required for estuarine development may be issued only for uses or activities that have been determined to be consistent with the applicable enforceable policies of the estuary management plan.

As Oregon’s designated coastal management agency, the Department of Land Conservation and Development (DLCD) is charged with making federal consistency determinations on federal actions and permits in the coastal zone. In making these decisions, DLCD coordinates with local jurisdictions to determine consistency with enforceable policies in locally adopted estuary management plans.

While federal consistency precludes the issuance of federal permits for development that is inconsistent with enforceable policy provisions of the estuary management plan, a determination that a proposed development is consistent with the enforceable policies of the EMP does not obligate federal agencies to approve permits for that development. The federal agency must still determine that the proposed use or activity complies with all applicable federal statute and regulation requirements, which are independent from the enforceable policies of the estuary management plan.

PART XI - UPDATING THE PLAN

Proposed revisions as part of the 2023 update

The Lincoln County Estuary Management Plan (EMP) was originally adopted in 1983. The first comprehensive update of the EMP was completed in 2023. The relatively static nature of the EMP over this period can be attributed to a number of factors. Significant is the fact that the EMP has been generally effective in accomplishing both conservation and development objectives. Also, due to the relative complexity of the EMP and the need to engage a wide range of agencies and interests in its development, the comprehensive update process is commensurately complex and demanding of resources.

Due largely to these factors, it is anticipated that both the need and available capacity for comprehensive updates of the EMP will remain limited. The likelihood is that the time interval for comprehensive updates will be long.

However, it is both feasible and desirable to adapt the EMP over shorter periods of time in response to changes in conditions and relevant trends. It is the purpose of this part of the EMP to provide guidance to the implementers of this plan on evaluating the desirability for adaptive updates of the EMP to address specific changes in conditions.

Legal Framework

The EMP is an element of the Lincoln County Comprehensive Plan, thus updates to the EMP must be accomplished in accordance with state and local statutes and rules governing comprehensive plan amendments.

Post Acknowledgement Amendment Requirements

Amendments to either the text, maps, or implementing regulations of the EMP are subject to the requirements of Oregon Administrative Rules, Chapter 660, Division 18. In summary, these rules require the applicable city or county jurisdiction to provide notice to the Department of Land Conservation and Development (DLCD) of any proposed amendment at least 35 days prior to the first evidentiary hearing on the proposed amendment. The Department may participate in the local hearing process as a party.

The local jurisdiction must submit the adopted amendment to DLCD within 20 days after the decision to adopt the change.

Local Initiation and Review Procedures

Local plan and land use regulation amendments may be initiated in several different ways, depending on the jurisdiction and the provisions of the local land use code. Typically, a quasi-judicial map amendment may be initiated by application of the property owner, or by the jurisdiction’s governing body. In some cases, legislative amendments to the text of the plan or regulation may be initiated by application of a property owner, but in other cases, legislative amendment may only be initiated by the governing body or planning commission.

Similarly, local review of proposed amendments to the EMP or implementing regulations vary somewhat by jurisdiction, but in general require one or more public hearings and final adoption by the governing body. Adoption of plan amendments is by ordinance. Typically, a proposed amendment is first considered at a public hearing before the jurisdiction’s planning commission; upon completion of the hearing, the planning commission will forward a recommendation on the amendment to the governing body (city council or board of county commissioners). The governing body will conduct a second hearing before entering a decision to approve or deny the proposed amendment.

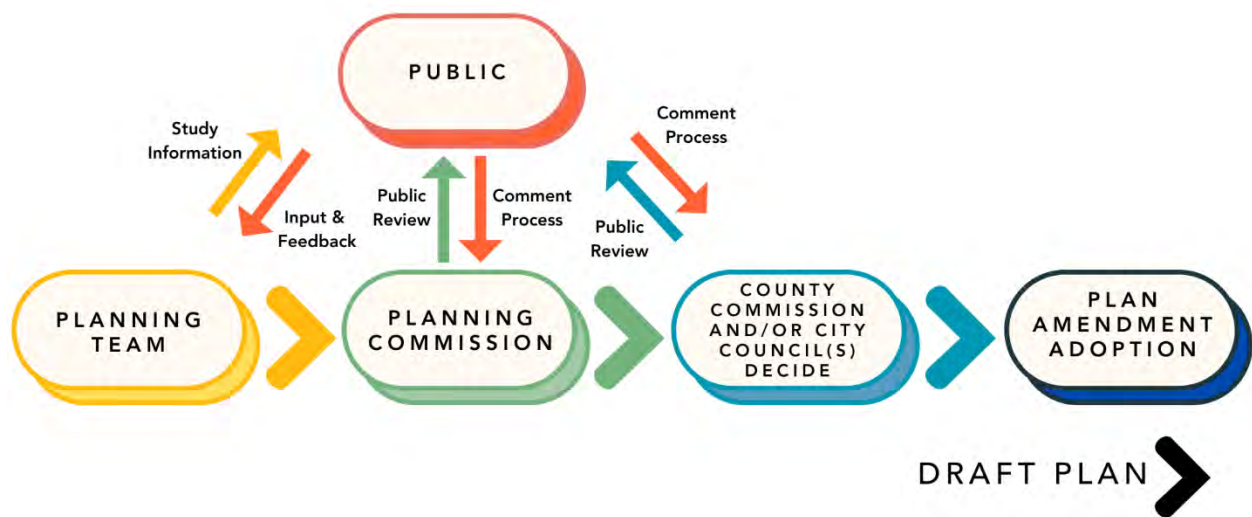


Figure 42. Local Plan Amendment Process

Adaptive Updates to the Estuary Management Plan

As noted, it is likely that there will be long intervals between comprehensive updates to the EMP. However, between these comprehensive updates, changes in conditions or in the types and intensities of specific uses may warrant more narrowly focused amendments to the plan in order to adapt to these changes.

The dynamic nature of the estuarine system makes precise forecasts of future conditions difficult. This difficulty is compounded by the largely uncertain impacts of climate change on both natural systems and the human uses which these systems support. In addition, history tells us that uses of the estuary will evolve in response to change, whether physical system changes, including those driven by climate change, changes in market forces, or a combination of these and other factors. It is recommended that local jurisdictions periodically review and update the resource inventory and accompanying maps if physical, biological, social, or economic conditions of the estuary have significantly changed.

Despite these uncertainties, there are at least two aspects of the EMP where change can be reasonably anticipated. The following are areas where local governments should periodically assess the need for adaptive updates to the EMP.

Changes in Jurisdictional Extent of the EMP

The policies and implementing regulations of the EMP apply to estuarine waters and associated wetlands, the extent of which, as defined by Goal 16, is Mean Higher High Water or, in the case of tidal marsh, the line of non-aquatic vegetation. This is in effect a “rolling” jurisdictional boundary and the precise demarcation between estuary and upland may shift based on changes in tidal elevations and conditions on the ground. The plan maps provide a graphic depiction of this boundary and, while not geodetically exact, the mapped boundaries do provide important guidance for plan users and local practitioners.

Sea level rise is likely to be a driver of geospatial changes in the jurisdictional boundaries of the EMP. While it is not possible to provide precise forecasts of the amount and rate of sea level rise, the general trends in sea level rise should be monitored by local governments insofar as they may affect the overall accuracy and utility of EMP maps. Periodic evaluation of the impact on sea level rise on jurisdictional boundaries is recommended. In cases where identified changes present significant discrepancies with adopted map boundaries, local governments should consider initiating plan map amendments in accordance with prescribed local procedures.

Restoration Activities

Restoration activities that create new estuarine areas impact the EMP in at least two ways. First, these new estuarine areas become subject to the jurisdiction of the EMP, thereby altering the spatial boundaries of the plan. Second, it is likely that newly restored areas will include sites that are on the plan’s inventory of potential restoration sites established in Part VII. These restored sites will no longer be “potential” restoration sites thus rendering the inventory out of date.

To adapt to these changes, local governments should monitor estuarine restoration activities with the objective of maintaining as current both the mapped spatial boundaries of the estuary and the inventory of potential restoration sites.

Revising plan maps to add restored sites to the estuary is best accomplished through a site-specific, quasi-judicial plan map amendment. In addition to inclusion within the jurisdictional boundary of the plan, restored sites must be evaluated in relation to other plan criteria to determine proper placement within the spatial scheme of management units, and be assigned an appropriate management classification in accordance with Part IV. These are very fact-specific determinations that are appropriately addressed through the individual map amendment process.

Local government staff should encourage owners of restored areas to plan for and, upon completion of restoration, make an application for the appropriate plan map amendment in accordance with prescribed local procedures. Owners of newly restored areas should reach out to Planning Department staff of the jurisdiction(s) with purview over the site's location to initiate conversations on process and the information required.

Revising the plan inventory of potential restoration sites can be accomplished on a periodic basis through the legislative amendment process. Frequency of this inventory update will be dependent on the level of restoration activity occurring in the estuary and other changes in conditions on the ground.

Recommended Updates

During the 2023 update, a Needs & Gaps Assessment (Assessment) was performed to identify the components of the Yaquina Bay Estuary Management Plan that needed to be modernized to reflect current conditions and improve plan usability and implementation. The Assessment categorized recommendations across three Tiers.

Tier 1 recommendations were accomplished through the 2023 update process.

Tier 2 recommendations are actions that would accomplish desirable modernization objectives but which, due to their scope and/or complexity, would be impracticable to complete within the limits of resources constraints of the 2023 update process.

Tier 3 recommendations are actions that cannot be practicably achieved through local planning processes without additional policy support or technical assistance from outside agencies.

The Assessment identified updates to Plan Parts V-Estuarine Use Standards and IX-Future Development Sites as Tier 2 recommendations. It is the responsibility of the local jurisdictions of Lincoln County, City of Newport, and City of Toledo to complete the comprehensive update of the Yaquina Bay Estuary Management Plan by updating these Plan Parts when capacity and resources allow.

APPENDIX A. DEFINITIONS

Proposed revisions as part of the 2023 update

ACCRETION: The build-up of land along a beach or shore by the deposition of waterborne or airborne sand, sediment, or other material

ACTIVE RESTORATION: The use of specific remedial action such as removing fills, breaching dikes, removing tide gates etc. to restore or replace original estuarine attributes (see RESTORATION)

AQUACULTURE: The raising, feeding, planting and harvesting of fish, shellfish or marine plants, including facilities necessary to engage in the use.

BENTHIC: Living on or within the bottom sediments in water bodies.

BOAT LAUNCHING: A facility designed for the launch, take out and/or tie up of recreational or smaller commercial craft. Such use may include commercial, public or individual private facilities. Boat launching does not include large scale marine railway facilities designed for marine industrial boat building and repair facilities.

BREAKWATER: A barrier, sometimes connected to the shore at one or both ends to break the force of waves. Used to protect harbors and marinas, breakwaters may be constructed of rock piling, concrete or may be floating structures.

BRIDGE CROSSING: A structure spanning a waterway designed to carry automobile, railroad and/or pedestrian traffic across the waterway. Maintenance or re- placement of bridge crossings means repair, restoration, or in-kind replacement of a bridge such that the number of travel lanes is not increased.

BRIDGE CROSSING SUPPORT STRUCTURES: Piers, piling, and similar structures necessary to support a bridge span but not including fill for causeways or approaches.

CLIMATE CHANGE: The increasing changes in the measures of climate over a long period of time including precipitation, temperature, and wind patterns.

CONDITIONAL: Refers to a use which may be permitted only after a case-by-case review and local conditional use approval has been granted. (See PART IV)

CONSERVE: To manage in a manner which avoids wasteful or destructive use and provides for future availability.

DIKE: An earthen embankment or ridge constructed to restrain high waters.

DOCK: A fixed or floating decked structure against which a boat may be berthed.

DOLPHIN: A group of piles driven together and tied together so that the group is capable of withstanding lateral forces from vessels or other objects.

DREDGED MATERIAL DISPOSAL: The deposition of dredged material in shorelands or estuarine areas.

DREDGING: The removal of sediment or other material from a water body, usually for the purpose of deepening a channel, mooring basin or other navigation area.

ECOSYSTEM SERVICES: Ecosystem services are the benefits that nature provides, such as purifying and cooling water or storing carbon dioxide.

ESTUARY: A semi-enclosed body of water connected with the ocean and within which fresh and salt water mix. The estuary includes (a) estuarine water; (b) intertidal lands; (c) sub-tidal lands; and (d) tidal marshes. Estuaries extend upstream to the head of tide; their landward extent is Mean Higher High Water or the line of non-aquatic vegetation.

EXCAVATION: Excavation of shoreland to create new estuarine surface area directly connected to other estuarine waters.

FILL: The placement of material in estuarine areas to create new shoreland area or raise the elevation of land.

GEOGRAPHIC INFORMATION SYSTEMS (GIS): A system that creates, manages, analyzes, and maps all types of data.

GROIN: A shore protection structure (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shoreline. Generally constructed of rock or other solid material.

INTERTIDAL: The area between mean lower low water and mean higher high water.

JETTY: An artificial barrier used to change littoral drift to protect inlet entrances from sedimentation and to direct and confine the stream of tidal flow. Usually constructed at the mouth of a river or estuary to help deepen and stabilize a channel.

LANDWARD MIGRATION ZONE: Upslope areas above the current Mean Higher High Water mark suitable for intertidal and subtidal habitats as local sea level rises.

MANAGEMENT UNIT: A discrete geographic area, defined by biophysical characteristics and features, within which certain uses and activities are protected, encouraged and protected and others are discouraged, restricted or prohibited.

MARINA: A shall harbor, boat basin or moorage facility providing dockage for recreational craft.

MEAN HIGHER HIGH WATER: The average of higher high waters over a 19 year period.

MEAN LOW WATER: The average of all the low water heights observed over the National Tidal Datum Epoch.

MEAN LOWER LOW WATER: The average of the lower low waters over a 19 year period.

MINERAL AND AGGREGATE EXTRACTION: The removal for economic use of minerals, petroleum resources , sand, gravel or other materials from the estuary.

MITIGATION: The creation, enhancement, or restoration of an estuarine area to maintain the functional characteristics and processes of the estuary such as its natural biological productivity, habitats and species diversity, unique features and water quality.

NOT ALLOWED: Refers to a use or activity which is not permitted. Can only be permitted upon adoption of a plan amendment.

OCEAN ACIDIFICATION: The reduction in the pH of the ocean over an extended period of time, caused primarily by the uptake of carbon dioxide (CO₂) from the atmosphere.

OUTFALLS: An outlet through which materials are discharged into the estuary. Outfalls include sanitary (sewer) discharges, storm drainage facilities, and other industrial waste discharges.

PASSIVE RESTORATION: The use of natural processes, sequences or timing to bring about restoration after removal or reduction of adverse stresses. (See Restoration)

PERMITTED WITH STANDARDS: Refers to a use which is permitted as consistent with the purpose and management objective of the management unit. Permitted uses must conform to the Estuarine Use Standards set for in the plan.

PIER: A structure extending into the water from solid land generally to afford passage for persons or goods to or from vessels, but sometimes to provide recreational access to the estuary.

PILING: A long, slender stake or structural element of steel, concrete or timber which is driven, jetted, or otherwise embedded into the bed of the estuary for the purpose of supporting a load.

PORT FACILITIES: Facilities which accommodate and support commercial fishery and navigation activities, including terminals and boat basins and moorage for commercial vessels, barges and oceangoing ships.

PRESERVE: To save from change or loss and reserve for a special purpose.

PROTECT: Save or shield from loss and reserve for a special purpose.

RESOURCE CAPABILITY: The ability of a natural resource site to be physically, chemically or biologically altered, or otherwise assimilate an external use, and still fulfill its estuarine resource role as stated in management objective of the individual management unit and the definition of the management classification in which it is located.

RESTORATION: Revitalizing, returning or replacing original attributes and amenities, such as natural biological productivity, which have been diminished or lost by past alterations, activities or catastrophic events.

RIPARIAN: Of, pertaining to or situated on the bank of a river or other body of water.

GLOBAL SEA LEVEL RISE: The increase currently observed in the average Global Sea Level Trend, which is primarily attributed to changes in ocean volume due to two factors: ice melt and thermal expansion.

SHORELANDS: The area adjacent to the estuary and its wetlands. The lower boundary of the shorelands is Mean Higher High Water or the line of non-aquatic vegetation; the upper boundary is the shorelands boundary, which is established on the basis of a number of inventory characteristics. Shorelands extend upstream to the head of tide.

SHORELINE STABILIZATION: The stabilization or protection from erosion of the banks of a waterway by vegetative or structural means.

SIGNIFICANT HABITAT AREAS: A land or water area where sustaining the natural resource characteristics is important or essential to the production and maintenance of aquatic life or wildlife populations.

STORM SURGE: An abnormal rise of water generated by a storm, over and above the predicted astronomical tides.

SUBMERSED CROSSINGS: Power, telephone, water, sewer, gas or other transmission lines which are constructed beneath estuarine waters, usually by embedding into the bottom of the estuary.

SUB-TIDAL: Below the level of mean lower low water.

TEMPORARY ALTERATIONS: May not be for more than three years and the affected area must be restored to its previous condition.

TIDAL MARSH: Estuarine wetlands from the line of non-aquatic vegetation down to the end of vegetated flats, which is approximately the lower high water level.

TRIBAL CULTURAL RESOURCES OR PRACTICES: Any place in which a relationship, past or present, exists between a spatial area, resource, and an associated group of indigenous people whose cultural practices, beliefs, or identity connects them to that place. A tribal cultural landscape is determined by and known to a culturally related group of indigenous people with relationships to that place.

WATER DEPENDENT: A use or activity that can only be carried out on, or in adjacent to the water because the use physically or economically requires access to the water body for water borne transportation, recreation, energy production or source of water. Non-water dependent accessory uses may be permitted in conjunction with a primary water dependent use. In general, such non-water dependent uses should not exceed 10% of the total area of the use. Variations to this standard may be permitted if it is found that additional area is required for non-water dependent uses essential to the functioning of the primary water dependent use(s).

Examples of water dependent uses include, but are not limited to:

- Marinas
- Aquaculture
- Marine ways
- Seafood processing plants
- Marine shipping terminals
- Charter boat operations
- Marine fuel sales

WATER RELATED: A water related use is:

- a. a use which derives a cost savings advantage (not associated with land costs or rent) from a location on or near the water; or
- b. a use whose location on or near the water is essential to the functioning of adjacent water dependent uses

Examples of water related uses include, but are not limited to:

- Marine supply sales
- Bait and tackle shop
- Commercial fishing gear storage
- Seafood market

WETLANDS: Land areas where excess water is the dominant factor determining the nature of soil development and the types of plant and animal communities living at the soil surface. Wetland soils retain sufficient moisture to support aquatic or semi-aquatic plant life. In marine and estuarine areas, wetlands are bounded at the lower extreme by extreme low water; in freshwater areas, by a depth of six feet. The areas below wetlands are submerged lands.

WHARF: A structure built alongside a waterway for the purpose of receipt, discharge and storage of goods and merchandise from vessels.

APPENDIX C. GOAL EXCEPTIONS

From original EMP document (not updated)

GOAL 16 EXCEPTION TO ALLOW AQUACULTURE DEVELOPMENT AT POOLE'S SLOUGH

Description

The area addressed by this exception includes tidal marsh and some limited intertidal lands at the mouth of Poole's Slough in management unit 19. Exception is taken to the Goal 16 "Natural" management requirements to allow dredge, fill and other activities for aquaculture development. These activities would otherwise be prohibited by the Goal in areas qualifying for natural management.

The aquaculture development proposed for the area involves the expansion of the existing Newport Pacific Corporation oyster facility and an adjacent operation to utilize a modified out-of-bay culture, a local seed technique to provide production and nursery operation.

The project would be accomplished in three phases. The first phase of the project would see maintenance dredging of a silted in channel from the firm's Poole Slough and Yaquina Bay growing grounds to their processing house. The 30 foot wide channel would be deepened some 5 feet for its 800 foot length. The resulting dredgings would be used to create a 100 x 32 foot tract of land in a sub-slough fronting the existing up-land site, and would become the site of a new processing plant and seed production operation.

Phase II of the plan would create by dredging, two modified out-of-bay rearing channels in the tidal marsh area, each 16 feet wide and 400 feet long, and a workway for mechanical equipment between them. Nearly all of the dredged material would be used to build the workway, with the small surplus taken to the new plant site.

The nursery channels, through the construction of berns, baffles, tidegates, etc. will function as an outdoor incubator driven by the tides and direct solar heating. Oyster seed larvae will initially be brought in from a Netarts Bay hatchery and later from an on-site hatchery), and placed in the nursery area. Once the larvae have set, the resulting spat will be transplanted into the subtidal channel of Poole's Slough and adjacent areas of Yaquina Bay for the final growth phases. At maturity, the oysters will be harvested and delivered by boat to the shucking house for processing.

Phase III would see a staged expansion in the number of rearing channels up to a maximum of 18, with the dredged material expanding the original plant site to provide for shell-storage, seed processing operations, and a larval hatchery. The additional seed production capacity provided by the Phase III channels should provide sufficient production for seeding all suitable oyster growing in Yaquina Bay, with some seed production for outside markets a possible eventuality.

In total, the completed plan would involve approximately 5.35 acres of the land, consisting of 3.45 acres of dredging and 1.9 acres of fill.

Need

Commercial oyster growing has taken place in Yaquina Bay since before the turn of the century. Current oyster production is about 8,000 gallons per year. Roughly 200 acres of the bay (out of 600 acres which have been identified as suitable by the Oregon Department of Fish and Wildlife) are currently in production.

For complex biological reasons, the native Yaquina oyster failed to adequately re-propagate and commercial production demands necessitated turning to external seed sources. Growers utilized the larger Pacific oyster, which grows well in Yaquina Bay, but does not successfully spawn. Japan, for decades, was the only source of seed. Historically, oyster production has been limited by the expense and inadequate availability of seed and long (3-4 yrs.) growth cycles. Because of these limitations on production, the capital investment necessary for improving harvesting, processing and other operations has not been feasible.

Oregon State University and other institutions have intensified various research programs in an effort to overcome these limitations. The creation of new genetic oyster strains, production of regional seed sources and other factors have combined to increase somewhat the overall efficiency of oyster operations.

As a result of this work, for example, most Northwest oyster seed is now produced domestically in "eyed larval" hatcheries, with growers setting their own seed. More recently, advancing research on "out-bay" culture techniques offers great commercial promise for more efficient spat production and the reduction of total growth time.

The underlying principle of out-bay culture is water control hence the control of algal production. Usually single celled algal plankton reproduce once every twenty-four hours. By controlling the rate of water exchange in a closed water mass, plankton blooms can be encouraged. Nutrients for the system can come from upwelled seawater or supplied as organic or in-organic fertilizer. Tests have shown that oyster seed can grow up to four times faster in such a system in comparison with non-manipulated seawater.

Modified out-bay culture which is proposed for Poole's Slough would entail developing dredged channels which would provide nursery areas for oyster seed.

Setting eyed larvae as currently practiced in Yaquina Bay necessitates the two day old seed being placed directly in the estuary. By placing the seed in controlled nursery areas, accelerated growth is anticipated. According to professor Wilbur Breese of Oregon State University this will increase survival

and provide larger and healthier seed in less time. Hopefully the benefits to the seed will allow the oysters to reach market size from six months to a year earlier, a reduction in growth time of from 15 to 30 per cent.

The development of a seed production and nursery operation of this type provides the potential for putting into production large areas of Yaquina Bay which are currently underutilized for oyster growth. This local source of seed is felt to be a key step in realizing the full potential of the oyster industry in Yaquina Bay.

Alternatives

The following sites and designs are felt to represent the theoretical alternatives to the modified out-bay culture project proposed for Poole's Slough:

Upland Locations - The use of a remote upland location would involve construction of tanks and/or ponds to provide oyster nursery areas. Water would have to be pumped from the estuary to the site and returned via an outfall. A feasible upland site would need to be located in reasonable proximity to the estuary in order to provide access for a water source and also for moving the juvenile oysters by vessel from the nursery area to the open water areas of the estuary for the final growth stages.

No upland sites with suitable area (approximately 5.5 acres) are known to exist within the "oyster zone" of Yaquina Bay (River Bend to Grassy Point). Extreme topography along this portion of the estuary severely limits suitable area for a project of this nature. Relatively low, level lands are limited to tidal marsh or intertidal flat areas, which would require dredge and fill activities for project construction.

Suitable upland areas are available both above and below the oyster zone. Upland areas suitable for water dependent use are available in the Toledo area; however winter salinities in this area are too low to allow for oyster growth. Upland areas are available in the Yaquina sub- area (Coquille Point) and in the Newport area (McLean Point; South Beach). None of these areas have access to State certified shellfish waters, and water quality and ultra violet sterilizers).

Diked shorelands within the oyster zone were also examined as possible alternative sites. Several small diked areas are present along County Road 515 (north shore) between River Bend and Grassy Point. None of these areas is large enough to provide the needed area for an integrated nursery processing facility and none has vessel access for replanting of spat. (Provision of vessel access to these areas would require extensive intertidal dredging.) Further, resource agencies have indicated that, despite being partially diked, these areas are still classified as wetlands and would require full environmental review under Section 404 for needed dredge and fill activities (and would require either Goal 16 or 17 exceptions). Due to the scarcity

of mitigation sites in Yaquina Bay, these diked areas have been identified and reserved as needed mitigation sites.

Diked shorelands are also potentially available in the Boone's and Nute's Slough areas. Sufficient area is available at both of these sites for the proposed facility. State certified shellfish water is not available, and water quality control equipment would be required. Vessel access to this area is not available; intertidal dredging in a Natural management unit would be required to provide such access.

All of the above diked shoreland sites would require major construction activities to breach existing dikes and provide tidal openings through the fill bed of County Road 515. Several sites would also involve removal and relocation of large tidegates. All of these sites have the additional limitation of being located across County Road 515 from the estuary itself. This would necessitate crossing the county road (classed as a major arterial) regularly with equipment, cages, trays etc. as they are transferred from the nursery areas to the open water areas, a potentially hazardous situation.

Finally, all of the potential sites along the north shore which are outside of the City of Newport (diked shoreland and other upland) have no known source of fresh water. Groundwater supplies are uncertain and known surface water supplies available for appropriation are not adequate. It is anticipated that at eventual capacity, the nursery and processing facilities will require substantial quantities of fresh water.

Open Water Areas - Open water areas in the oyster zone have been considered in the past for use as oyster nursery areas. There are several serious limitations with the use of these areas. First, and most important, is the fact that to properly establish and monitor accelerated growth techniques requires minimizing the many environmental variables, which is extremely difficult to accomplish in an open water situation. Use of such areas largely nullifies the anticipated advantages of the relatively isolated and controllable environment provided by the modified out-bay technique. Additional problems with the use of these areas include possible damage from boat traffic, heavy winds and strong tidal currents; potential conflicts with established users of the water surface area such as boaters and anglers; and potential vandalism and security problems.

Design Alternatives - Design alternative involving man made channels or ponds constructed on adjacent shoreland areas have been considered under "upland alternatives."

It is theoretically possible to provide construction of processing and other landside facilities on piling, thus minimizing the amount of fill needed. This would be possible at the Poole's Slough site as well as several locations on the north shore of the oyster zone along County Road 515. However, due to the amount of area needed for the project (at least 60,000 square feet) this is not felt to be an economically feasible alternative. Local contractors' current cost estimates for

pile supported structure are approximately \$20 per square foot. This would require an initial capital cost of 1.2 million dollars for construction of these facilities; at least five times the cost of construction on fill. In addition, ongoing maintenance and repair costs for pile supported structures would significantly increase the cost of operation.

A final design alternative involves the use of the Poole's Slough site for construction of the nursery area and locating the remaining landside facilities at other less environmentally sensitive locations. For successful operation, both the nursery facility (i.e. the rearing channels) and processing facilities must be located in close proximity to the open water growing grounds (for efficient transfer of spat and harvested oysters) and have vessel access (to provide for direct transfer of spat or harvested product to and from the growing grounds). Due to extreme topography and inadequate water depths, no upland sites are available in the oyster growing zone which could provide suitable area for a processing facility.

The operators of this proposed facility believe that integrating these uses at one location will be essential to an economical operation. Numerous capital and operating costs, including personnel, equipment, utilities, transportation, and initial facility construction could be at least partially consolidated and thereby significantly reduced through the combining of operations at a single site. Since the economics of this proposal are currently untested, such factors may be key to successful operation.

In summary, the site and facility design for the proposed Poole's Slough oyster nursery operation meet the following essential requirements (alternatives considered are all found to be deficient relative to one or more of these requirements):

1. Slough Facility can be operated using direct tidal exchange for the rearing channels. No pumping or other water and exchange facilities are required. Based on power and equipment cost estimates, an upland site requiring pumping would add over \$6,000 per month to the facility's operating costs. This cost factor renders the use of upland sites or full "out-bay" techniques impractical.
2. The Poole's Slough site has excellent water characteristics or oyster growth. Sites upriver from the oyster zone do not have access to waters with suitable salinity and nutrient characteristics. Sites downriver do not have access to State Health Division certified shellfish waters. These waters could only be used after processing with sand filters and ultra-violet sterilizers. According to representatives of Becker Industries (designer and manufacturers of sophisticated water filtration systems) this equipment would cost a minimum of \$150,000, plus installation, maintenance and operating costs, amounts which would render the project economically impractical.

3. Adequate space can be made available for an integrated nursery – processing facility at the Poole's Slough site. No other sites which meet the above requirements 1 and 2, have this needed area available.
4. Poole's Slough has adequate road and navigational access. Potential diked shoreland sites along the north shore of the oyster zone would require extensive dredging to provide vessel access. Upland and open water areas on the south shore downriver of Poole's Slough have no road access.
5. Poole's Slough has a reliable source of fresh water available. The Seal Rock Water District main line runs past the Poole's Slough site. It is unlikely that groundwater supplies elsewhere in the oyster zone would be adequate for the operation of the proposed facility.

Environmental Consequences

Approximately 5 acres of tidal marsh would be lost to dredge and fill activities as a result of the proposed project. This would result in the loss of primary productivity, detrital export, favorable water filtration and wildlife habitat. While this is a relatively small portion of the total area of tidal marsh in Yaquina Bay (approximately 819 acres), tidal marsh is considered a scarce habitat type in the estuary when compared to past abundance and to Oregon estuaries of similar size. The loss of even a small portion of a major tract of tidal marsh such as Poole's Slough must be considered a serious environmental consequence.

Actual loss of estuarine surface area will be limited to the approximately 1.9 acre area of fill. The roughly 3 acres of dredged area will result in high tidal marsh habitat being replaced by shallow sub-tidal habitat. Most, if not all of these negative environmental consequences can likely be compensated for through appropriate mitigation. Several potential sites for the restoration of tidal marsh are available in this area of the estuary (see Mitigation Sites).

Socio-Economic Consequences

With the development of new aquaculture facilities in this area, the oyster industry's efforts to expand production would be significantly enhanced. The local economy will realize the positive employment and economic spin-off that will result from the expansion of this basic industry. It is estimated that expansion of the oyster industry as a result of the proposed development could provide from 30 to 50 jobs and increase oyster production to 750 gallons weekly. This will help the county to further its economic goals of diversifying and stabilizing the local economy.

The Poole's Slough area has been identified by the Oregon Natural Heritage Program as a potential significant natural area. However, according to refinements of the ONHP Data Summary for Lincoln County, the Poole's Slough area does not qualify for consideration as an ecologically or scientifically significant natural area (See Goal 5 Inventory, Lincoln County Comprehensive Plan). A long history of human-use and disturbance, particularly in the area

near the mouth of the slough indicate that it is not suitable for consideration as a significant natural area.

Energy Consequences

Energy will be conserved by allowing provision of navigational access to existing facilities on Poole's Slough. Currently, harvested oysters are unloaded at a site near River Bend Moorage, trucked up the Bay Road to Toledo, and back down the South Bay Road to Poole's Slough. This 12 mile trip would be eliminated, as oysters could be delivered directly by boat once historically used channels are re-established through dredging. In addition, the proposed site and design provides the most energy efficient design for this type of nursery facility. Tidal and solar energy will be employed to provide the water circulation and temperature control needed for enhancing oyster production.

Compatibility

Existing uses in and around Poole's Slough include aquaculture operations, boating, angling, waterfowl hunting, commercial forestry uses, widely scattered rural residences, biological productivity and fish and wildlife habitat. Currently, no compatibility problems exist in this area. It is anticipated that the expansion of the existing aquaculture facilities in this area will represent a continuation of an existing use pattern and will be compatible with surrounding uses.

Existing boat traffic and occupation of surface area will not increase significantly and thus will not conflict with anglers, boaters, hunters or other public water users. Existing residences in this area are all entirely screened from the project site, thus no conflicts should arise as a result of these uses.

The proposed project is located entirely within an aquatic area and is buffered by privately owned upland areas. Commercial forestry activities in the vicinity will not be affected in any way by the proposed expansion. The proposal will adversely impact biological productivity and wildlife habitat only on the small area actually included in the project site. The project site is geographically isolated from other areas important for productivity and habitat (i.e. McCaffery's Slough and upper Poole's Slough).

The influence of human activity on surrounding areas will not be significantly greater than it is at present. Therefore, the proposed facility will not conflict with the area's overall values for biological productivity and fish and wildlife habitat.

Poole's Slough Aquaculture Proposal - Development Summary

PHASE I

1. DREDGE SUB-SLOUGH CHANNEL - POOLE SLOUGH TO ROAD.
 - A. 30' wide by 5' deeper (from +3.0 to -2.0) by 800' length..
 - B. Provides 4,444 cu. yds. material.
 $\frac{12,000 \text{ cu. ft.}}{27 \text{ cu.ft./cu.yd.}} = 4,444 \text{ cu. yds.}$

2. DREDGE ADDITIONAL 25' x 100' x 5' DEEPER TO CREATE TURNING BASIN OF 55' x 100' x 5' DEEPER.
 - A. Provides 463 cu. yds. material.
 - B. $\frac{12,500 \text{ cu. ft.}}{27 \text{ cu.ft./cu.yd.}} = 463 \text{ cu. yds.}$

3. CREATE NEW PROCESS PLANT SITE AT ROAD.
 - A. Fill 100' wide front channel 10' deep (to +13.0) x 132.6' long.
 - B. 100' x 10' = 1,000 cu. ft. and 37 cu. yds. per running foot.
 - C. $\frac{4,907 \text{ cu. yds.}}{37, \text{cu. yds. per foot}} = 132.6 \text{ ft. length}$
 - D. $100' \times 132' = 13,200 \text{ sq. ft.}$
 $\frac{13,200 \text{ sq. ft.}}{43,000 \text{ sq. ft. per acre}} = \text{Plant Site } 0.31 \text{ acres}$

PHASE II

1. CREATE THREE REARING CHANNELS 16' WIDE x 6' DEEP 400' LONG.
 - A. With slope, plan 10' at bottom and 16' at +9' level.
 - B. Plan dredged depth to +3.0'.
 - C. For calculation, plan 13' wide ave. x 6' deep x 400' per channel.
 $13 \times 6 \times 400 = 31,200 \text{ cu. ft. or } 1,156 \text{ cu. yds. dredged.}$

Development Summary

- D. $1,156 \text{ cu. yds.} \times 2 \text{ channels} = 2,311 \text{ cu. yds. dredged.}$
- E. $\text{Dredge } 16' \text{ wide} \times 400' \times 2 = 12,800 \text{ sq. ft. or}$
 0.30 acres.
2,311 cu. yds.

2. CREATE ENTRY AND EXIT DITCHES AT EACH END.

- A. $\text{Ditch } 10' \text{ wide (plan } 7' \text{ average)} \times 8' \text{ deeper (+1.0)} \times 50' \times 2 \text{ ditches.}$
- B. $7' \times 8' \times 50' \times 2 = 5,600 \text{ cu.ft.}$
 $\text{or } 207 \text{ cu. yds.}$
Dredge $\frac{207 \text{ cu.yds.}}{2,518 \text{ cu.yds.}}$

3. BUILD WORKWAYS TO SERVICE CHANNELS.

- A. $\text{Build } 25' \text{ wide} \times 50' \text{ long main workway at}$
 $13' \text{ level (+9.0 to +13.0)}$
 $25' \times 4' \times 50' = 5,000 \text{ cu. ft. or } 185 \text{ cu.yds.}$
185 cu. yds.
- B. $\text{Build } 2 \text{ channel workway } 16' \text{ wide} \times 400' \text{ long @ } 13' \text{ level.}$
 $16' \times 4' \text{ depth} \times 400' = 25,600 \text{ cu. ft.}$
 $\text{or } 948 \text{ cu. yds.}$
TOTAL FILL $\frac{948 \text{ cu. yds.}}{1,133 \text{ cu. yds.}}$
- C. $\text{Total dredge area} = 16' \times 400' \times 2 \text{ channels} =$
 $6,400 \text{ sq. ft. or } 0.3 \text{ acres}$
SURPLUS FILL $1,385 \text{ cu. yds.}$
TO PLANT SITE
- D. $\text{Total fill } 25' \times 50' + 16' \times 400' \times 2$
 $\text{channels or } 1,250 + 12,600 \text{ or } 14,050 \text{ sq. ft.}$
 $\text{or } 0.33 \text{ acres.}$
TOTAL DREDGE AND FILL $0.63 \text{ acres} +$

PHASE III

1. DEVELOP - BY STAGES - ADDITIONAL REARING CHANNELS.

- A. 16 additional channels - 18 total.
- B. Each channel requires dredgin 1,156 cu.yds.
 $\times 16 \text{ channels.} = 18,496 \text{ cu.yds. dredged}$
- C. Each channel = 0.15 acres dredged. = 2.4 acres dredged

Development Summary

- D. Plan one workway per two channels.
1. Plan 8 added workways (total of 9).
 2. 16' x 400' x 8 = 51,200 sq. ft. or 1.2 acres filled
 3. Add 50' main workway (Plan 48' lineal per 2 channels) or 50' x 48' x $\frac{16 \text{ channels}}{2}$ = 19,200 sq. ft. or 0.45 acres.
0.45 acres filled
- E. Add entry exit ditches of 48' x $\frac{16 \text{ channels}}{2}$ x 2 ditches x 7' average width = 5,376 sq. ft. or 0.13 acres dredged
1-7' wide x 384' length x 8' deep = 21,504 cu. ft. or 796 cu. yds. 796 cu. yds. dredged

TOTAL DREDGED 19,292 cu. yds.

TOTAL FOR WORKWAYS
 1-total sq. ft. (57,200 + 19,200)
 is 70,400 x 4' depth = 281,600 ÷ 27
 = 10,430 cu. yds.
 SURPLUS TO PLANT SITE $\frac{10,430}{8,862}$ cu. yds.

2. DEVELOP REMAINDER OF PLANT SITE.

- A. Use surplus from ditches and channels.
1. 8,862 cu. yds. from Phase III + 1,385 cu. yds. from Phase II or 10,247 cu. yds.
- B. Plan 100' wide x 10' deep or 37 cu.yds. per running foot.
- C. $\frac{10,247}{37} = 277$ lineal feet
- D. 277 x 100' wide = 27,700 sq. ft. = 0.64 acres fill
- E. Add Phase II surplus of 1,385 cu. yds. to create fill of
 $\frac{1,385 \text{ cu. yds}}{37 \text{ cu. yds. per foot @ 100' width x 10' deep}} = 68$ lineal feet
 and 6,800 sq. ft.
 .16 acres
 TOTAL FILL $\frac{0.64 \text{ acres} + .16 \text{ acres}}{0.8 \text{ acres}}$

OUT OF BAY CULTURE POWER USE ANALYSIS (Cont.)

5. PUMP STATION INSTALLATION AND PIPING COSTS NOT ADDRESSED.

6. TOTAL COSTS W/O INSTALLATION - PIPING.

A. Pump amortization \$3,000 yr./12 mo's =\$ 250.00 mo.

B. 200 KW demand x \$10.00 =\$2,000.00 mo.

C. KWH usage @ 0.027 KWH =\$3,888.00 mo.

TOTAL \$6,138.00 mo.

APPENDIX D. CLIMATE VULNERABILITY

New appendix proposed as part of the 2023 update

The list of climate vulnerabilities specific to Yaquina Bay and the Lincoln County Estuary Management Plan (EMP) was developed during the 2023 EMP under the guidance of the planning process' Technical Sub-Group, Advisory Group, and Steering Committee. In Plan Part III - Sub-Areas each sub-area describes applicable climate vulnerabilities sourced from this list.

Shoreline and Habitat

- Increased shoreline erosion due to changes in sediment transport and deposition patterns or increased intensity of storm surge
- Increased demand for shoreline protective structures due to increased erosion from sea level rise and storm surge
- Aquaculture and recreational shellfish losses due to ocean acidification that impairs the formation of oyster shells
- Loss of suitable habitat conditions for eelgrass, Sitka spruce swamps, or other critical species and habitats due to sea level rise, warming waters, or increased downstream sedimentation
- Increased risk of shoreline protection structures, pilings, or jetties becoming underwater hazards due to sea level rise
- Increased risk of failure of shoreline protective structures due to storm surge and sea level rise
- Loss of carbon capturing (blue carbon) habitat due to sea level rise
- Conflicts between migrating wetlands and adjacent shoreland uses
- Extended use of salt marshes, eelgrass beds, tidal channels and other cool water refugia habitats for juvenile salmonids and forage fish such as herring, anchovies, and smelt due to warmer upriver temperatures in the mid-summer to early fall
- Increased use of productive estuary habitats by marine birds during periods of low food abundance in the ocean, which are associated with marine heat waves and climate-driven changes in ocean processes
- Increased use of Yaquina Bay habitats by migratory birds as other regional habitats become unsuitable for climate-related reasons (i.e. climate-related shifts in breeding, migration, and overwintering ranges)

Infrastructure and Facilities

- Increased frequency and extent of storm surge flooding due to sea level rise risking the integrity and hindering the use of critical infrastructure
- Water damages to housing structures or mobile homes from riverine flooding due to sea level rise
- Increased risk of jetty or breakwater failures due to sea level rise and storm surges

- Increased risk of structural failure of boat ramp and recreation facilities due to sea level rise and storm surge
- Increased risk of loss of structural integrity to underground or submerged infrastructure due to higher water tables from sea level rise
- Increased risk of flooding to bay adjacent public roads and streets due to sea level rise
- Increased risk of tide gates and dike failures due to sea level rise and storm surge
- Increased risk of sea level rise submerging port, marina, and other moorage space infrastructure
- Increased risk to current dredging regime or location of navigation channels as erosion and accretion patterns change due to sea level rise and storm surge
- Increased risk of riverine flooding of public infrastructure due to tidal amplification, sea level rise, and storm surge

Pollution or Toxic Event

- Increased frequency and extent of storm surge flooding due to sea level rise of bay-adjacent industrial and waste treatment sites increasing risk of structural damage and pollution event
- Increased risk of bay and groundwater pollution (nutrient loading) from bay adjacent septic systems and higher water tables due to sea level rise
- Increased risk of combined sewer overflow (CSO) events due to sea level rise, riverine flooding, and changing winter precipitation patterns
- Increased risk of toxic leaks from erosion and destabilization of submerged sewer, natural gas and other pipes and utility lines due to changes in sediment transport and deposition patterns
- Increased risk to livestock in bay adjacent pasture land due to sea level rise and storm surge

APPENDIX E. RESTORATION & MITIGATION SITES LIST

New appendix proposed as part of the 2023 update

The following is the list of Restoration and Mitigation sites included in the Lincoln County Estuary Management Plan. This list was developed during the 2023 update and more information on the process for compiling sites can be found in Plan Part VII: Mitigation & Restoration.

Mitigation sites are in orange.

The list was last updated 6/12/2023.

Label	Acres	Site Description	Vegetation Description
Yo1	33.5	tidal marsh S of Hatfield Marine Science Center on W side of bay	low to high tidal marsh along bay margin; to W (W of dikes & roads), some freshwater wetlands where not filled
Yo2	14.5	tidal marsh just N of airport, & W of airstrip	low to high tidal marsh, disturbed and weedy just N of airport hangars
Yo3	35.2	diked tidal marsh N of Airport (N end of Sunny Ridge)	high tidal marsh, possibly sedge marsh, maybe mixed with freshwater marsh where tidal flow is impeded
Yo4	8.9	tidal marsh at mouth of Babcock Creek	high tidal marsh dominated by tufted hairgrass, Baltic rush
Yo5	22.2	tidal marsh on E bank of Yaquina opposite Boone Slough	high tidal marsh dominated by tufted hairgrass
Yo6	839.1	extensive former tidal marsh, many remnant channels	freshwater wetland to upland pasture
Yo7	260.8	diked & ditched former tidal marsh (fed by Beaver Creek and Depot Creek)	freshwater emergent wetland and willow scrub-shrub wetland
Yo8	0.7	marsh in "notch" in N Bay Road, just S of mouth of Boone Slough.	high tidal marsh dominated by tufted hairgrass
Yo9	14.5	N bank of Yaquina, N of N Bay Road, about 2 mi W of mouth of Boone Slough	high tidal marsh dominated by tufted hairgrass; lots of Puget Sound gumweed
Yo10	4.1	small tidal marsh opposite OR Oyster, ~1/2 mi W of Johnson Slough	high tidal marsh, dominated by tufted hairgrass

Label	Acres	Site Description	Vegetation Description
Y11	1.8	heavily grazed tidal marsh w/intact tidal channels, N side of N Bay Rd opposite W end of Grassy Point marsh	degraded tidal marsh (weedy, heavily grazed)
Y12	4.3	tidal marsh on N side of N Bay Rd. across from Grassy Point	high tidal marsh dominated by tufted hairgrass; lots of Puget Sound gumweed
Y13	2.2	tidal marsh on N side of N Bay Rd. (across from site 13a, a large undisturbed tidal marsh at bend in Yaquina). Just upstream of Nute Slough.	high tidal marsh dominated by tufted hairgrass, Baltic rush; may be degraded (lots of colonial bentgrass further in)
Y13a	32.4	tidal marsh at bend in Yaquina just upstream of Nute Slough	high tidal marsh dominated by tufted hairgrass
Y14	5.9	tidal marsh at mouth of unnamed creek about 1/2 mi W of Montgomery Creek	high tidal marsh; some areas of brass buttons (Cotula)
Y17	3.0	diked tidal marsh (naturally breached) @ S end, E bank of Olalla Slough	high tidal marsh/sedge marsh
Y18	0.6	mostly mud flat	mostly mud flat; degraded, but Lyngby sedge is recolonizing at edges
Y19	1.8	ditched, disturbed tidal marsh between Johnson Sl. & former hatchery	degraded high tidal marsh (weedy: thistles, colonial bentgrass)
Y20	2.5	former Reinoehl hatchery? small, degraded tidal marsh	degraded, partially tidal high marsh mixed with freshwater wetland (weedy)
Y21	11.9	diked & ditched former tidal marsh; some remnant channels, L bank Yaq SE of settling ponds	partially tidal high marsh (Lyngby sedge, tufted hairgrass) to fresh (bulrush/cattail) marsh, with upland areas (blackberry)
Y22	8.6	ditched tidal marsh; remnant channels, L bank Yaq SE of settling ponds	high tidal marsh dominated by Lyngby sedge, Agrostis spp.
Y23	3.8	Mill Creek wetlands, W bank nr mouth	high tidal marsh dominated by Lyngby sedge, tufted hairgrass; blackberry and Scotch broom on dike
Y24a	4.2	Mill Creek wetlands, W bank inside first hairpin bend	high tidal marsh with tufted hairgrass, some bulrush, thistles
Y24b	2.8	Mill Creek wetlands, E bank just upstream of first hairpin bend	brackish to fresh high tidal marsh
Y25	4.0	Mill Creek wetlands, W bank, cross-ditched area inside bend just above 24b	brackish to fresh high tidal marsh; reed canarygrass in ditched areas
Y26	5.9	Mill Creek wetlands, E bank nr. mouth	high tidal marsh dominated by tufted hairgrass, Lyngby sedge, orache

Label	Acres	Site Description	Vegetation Description
Y27	48.7	diked, ditched, heavily disturbed former tidal marsh, R bank of Yaquina upstream from Toledo	not accessible, but appears to be degraded high tidal marsh. Blackberry on dikes.
Y28	18.1	tidal swamp on E bank of Yaquina E of Toledo	tidal spruce swamp: Sitka spruce with brackish to freshwater tidal herbaceous layer dominated by tufted hairgrass, slough sedge, silverweed, Agrostis species, yarrow.
Y29	46.5	diked, ditched, partially filled former tidal marsh along Elk City Rd E of Toledo (W side of hairpin bend in Yaquina)	emergent and scrub/shrub freshwater wetland (reed canarygrass, willows, soft rush), some upland; some remnant tidal channels
Y30	23.9	tidal marsh, R bank of Yaquina just S of hairpin bend	not accessible, but appears to be high tidal marsh
Y31	8.1	mud flat w/fringing tidal marsh (incl. pocket slough ~1/4 mi W); S bank of Yaquina	mud flat with fringing high tidal marsh dominated by tufted hairgrass
Y32	18.6	tidal marsh on N bank of Yaquina at bend just downstream of Boone Slough	high tidal marsh dominated by tufted hairgrass
Y33	8.0	mud flat, small amts of fringing tidal marsh, S end of King Slough	mainly tidal flats with some fringing tidal marsh at S end
Y34	135.7	extensive tidal marsh	low to high tidal marsh, mostly high marsh dominated by tufted hairgrass, Baltic rush.
Y35	0.4	mud flat w/small amts of fringing tidal marsh, mouth of Montgomery Creek	mostly mud flat; fringing high tidal marsh dominated by tufted hairgrass
Y36	1.2	small freshwater wetland, formerly tidal, E side of Sally's Bend @ junction of John Nye Rd & N Bay Rd	nontidal freshwater emergent wetland (slough sedge)
Y37	210.6	diked, ditched former tidal marsh N of 10th Street/Sturdevant Rd barrier, on E side of Toledo	nontidal freshwater wetland (lots of reed canarygrass, some willows) and upland
Y38	19.4	diked, ditched former tidal marsh, E bank of Olalla just S of dam (remnant channels)	not accessible; diked, so possibly freshwater wetland
Y39	1.4	tidal flat, E bank of Yaquina just N of River Bend	mainly mud flat; some high tidal marsh at upper end, not accessible
Y40	245.7	extensive tidal marsh in lower reaches of Wright Creek	low to high tidal marsh; mostly high marsh dominated by tufted hairgrass. Transition to freshwater tidal marsh at upper end into Wright Creek.
Y41	1.3	very small former tidal marsh just S of Weiser Point [=Kevin Hill's Marine site = Margaret's Marine Ways]	degraded high tidal marsh /freshwater marsh. Not accessible.

Label	Acres	Site Description	Vegetation Description
Y42	12.5	diked, partially tidal wetland on N bank of Yaquina, N end of hairpin bend along Elk City Road	freshwater wetland (reed canarygrass) to upland (blackberry)
Y43	4.6	tidal marsh on W bank of Yaquina, N of River Bend (opposite Weiser Point)	not accessible; appears to be high tidal marsh
Y44	7.4	n/a	n/a
Y45	13.6	n/a	n/a
Y46	4.2	n/a	n/a
Y47	12.3	n/a	n/a
Y48	2.2	n/a	n/a
Y49	3.2	n/a	n/a

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APPENDIX F - ESTUARY ZONING DISTRICTS

New appendix proposed as part of the 2023 update

The following is template language for the adoption of Natural, Conservation and Development estuary zoning districts into the zoning code for Lincoln County, the City of Newport, and the City of Toledo.

Section XXX Estuary Natural Zone E-N

In an E-N zone the following regulations shall apply:

1. Application:

The provisions of the E-N zone shall apply to those estuarine aquatic areas within the boundaries of Natural Management Units as designated in the Lincoln County Estuary Management Plan. As used in this section, "estuarine aquatic area" means estuarine waters, submerged lands, tidelands and tidal marshes up to Mean Higher High Water or the line of non-aquatic vegetation, whichever is further landward.

2. Uses Permitted Outright:

The following uses and their accessory uses are permitted subject to the Special Policies of the applicable Management Unit and the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, and 1.1901 to 1.1999:

- (a) Undeveloped low intensity recreation requiring no aquatic area alteration.
- (b) Research and educational observations requiring no aquatic area alteration.
- (c) Projects for the protection of habitat, nutrient, fish, wildlife and aesthetic resources requiring no aquatic area alteration.
- (d) Passive restoration requiring no aquatic area alteration.
- (e) Bridge crossing spans not requiring the placement of support structures within the E-N zone.

3. Conditional Uses Permitted:

The following uses may be permitted subject to the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.1699 and 1.1901 to 1.1999:

- (a) Undeveloped low intensity recreation that requires aquatic area alteration.
- (b) Research and educational observations that requires aquatic area alteration.
- (c) Navigation aids such as beacons and buoys.
- (d) Projects for the protection of habitat, nutrient, fish, wildlife and aesthetic resources that require aquatic area alteration.
- (e) Passive restoration that requires estuarine aquatic area alteration.
- (f) On-site maintenance of existing functional tidegates and associated drainage channels, including, as necessary, dredging and bridge crossing support structures.
- (g) Riprap for the protection of uses existing as of October 7, 1977.
- (h) Riprap for the protection of unique resources, historical and archeological values and public facilities.

4. Additional Conditional Uses Permitted Subject to Resource Capability Test:

The following uses and their accessory uses may be permitted subject to the provisions of subsection (7) of this section and the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.1699 and 1.1901 to 1.1999:

- (a) Aquaculture that does not involve dredge or fill or other estuarine aquatic area alteration except that incidental dredging for harvest of benthic species or the use of removable structures such as stakes or racks may be permitted.
- (b) Communication facilities.
- (c) Active restoration of fish and wildlife habitat, water quality, or estuarine productivity.
- (d) Boat ramps for public use not requiring dredge or fill.
- (e) Pipelines, cables and utility crossings including incidental dredging necessary for their installation.
- (f) Installation of tidegates in existing functional dikes.
- (g) Bridge crossing support structures and dredging necessary for their installation.
- (h) Temporary alterations.

5. Special Standards:

Dredging, filling or other alterations of the estuary shall be allowed only:

- (a) In conjunction with a use authorized in accordance with subsections (3) and (4) of this section;
- (b) If a need (i.e., a substantial public benefit) is demonstrated;
- (c) The use or alteration does not substantially interfere with public trust rights;
- (d) If no feasible alternative upland locations exist; and
- (e) If adverse impacts are minimized.

6. Impact Assessment

All decisions authorizing uses in the E-N zone that involve alterations of the estuary that could affect the estuary's physical processes or biological resources shall include a written impact assessment. The impact assessment need not be lengthy or complex. The level of detail and analysis should be commensurate with the scale of expected impacts. For example, for proposed alterations with minimal estuarine disturbance, a correspondingly simple assessment is sufficient. For alterations with the potential for greater impact, the assessment should be more comprehensive. In all cases it shall provide a summary of the impacts to be expected. It should be submitted in writing to the local jurisdiction. It shall include:

- (a) The type and extent of alterations to be authorized;
- (b) The type of resources affected;
- (c) The expected extent of impacts on water quality and other physical characteristics of the estuary, biological resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary;
- (d) The expected extent of impacts of the proposed alteration should reference relevant Climate Vulnerabilities as described in applicable sub-area(s) and management unit (applicants are encouraged to document the use of any applicable data and maps included in the inventory such as sea level rise and landward migration zones) when considering future:

- i. continued use of the proposed alteration given projected climate change impacts
 - ii. water quality and other physical characteristics of the estuary,
 - iii. living resources,
 - iv. recreation and aesthetic use,
 - v. navigation, and
 - vi. other existing and potential uses of the estuary; and
 - (e) Methods to be employed to avoid or minimize adverse impacts.
- 7. Conditional Use Requirements:**
- All conditional uses in the E-N zone shall comply with the following standards:
- (a) The use is consistent with the management objective of the individual management unit; and
 - (b) The use complies with any applicable Special Policies of the individual management unit.
- 8. Additional Requirements for Conditional Uses Subject to Resource Capability Test:**
- In addition to all other applicable provisions of this section, conditional uses set forth in subsection (4) of this section are subject to the following requirements:
- (a) The use shall be consistent with the purposes of the Natural Management Unit classification;
 - (b) The use shall be consistent with the resource capabilities of the area. A use is consistent with the resource capabilities of the area when:
 - i. The negative impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant; or
 - ii. The resources of the area are able to assimilate the use and its effects and continue to function in a manner to protect significant wildlife habitats, natural biological productivity and values for scientific research and education.

Section XXX Estuary Conservation Zone E-C

In an E-C zone the following regulations shall apply:

1. Application:

The provisions of the E-C zone shall apply to those estuarine aquatic areas within the boundaries of Conservation Management Units as designated in the Lincoln County Estuary Management Plan. As used in this section, "estuarine aquatic area" means estuarine waters, submerged lands, tidelands and tidal marshes up to Mean Higher High Water or the line of non-aquatic vegetation, whichever is further landward.

2. Uses Permitted Outright:

The following uses and their accessory uses are permitted subject to the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, and 1.1901 to 1.1999 and the Special Policies of the applicable Management Unit:

- (a) Undeveloped low intensity recreation requiring no estuarine aquatic area alteration.

- (b) Research and educational observations requiring no estuarine aquatic area alteration.
- (c) Projects for the protection of habitat, nutrient, fish, wildlife and aesthetic resources requiring no estuarine aquatic area alteration.
- (d) Passive restoration requiring no estuarine aquatic area alteration.
- (e) Bridge crossing spans not requiring the placement of support structures within the E-C zone.

3. Conditional Uses Permitted:

The following uses may be permitted subject to the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.1699, and 1.1901 to 1.1999 and the Special Policies of the applicable Management Unit:

- (a) Undeveloped low intensity recreation that requires estuarine aquatic area alteration.
- (b) Research and educational observations that requires estuarine aquatic area alteration.
- (c) Navigation aids such as beacons and buoys.
- (d) Projects for the protection of habitat, nutrient, fish, wildlife and aesthetic resources that require estuarine aquatic area alteration.
- (e) Passive restoration that requires estuarine aquatic area alteration.
- (f) On-site maintenance of existing functional tidegates and associated drainage channels, including, as necessary, dredging and bridge crossing support structures.
- (g) Riprap for the protection of uses existing as of October 7, 1977.
- (h) Riprap for the protection of unique resources, historical and archeological values and public facilities.
- (i) Aquaculture that does not involve dredge or fill or other estuarine aquatic area alteration except that incidental dredging for harvest of benthic species or the use of removable structures such as stakes or racks may be permitted.
- (j) Communication facilities.
- (k) Active restoration of fish and wildlife habitat, water quality, or estuarine productivity.
- (l) Boat ramps for public use not requiring dredge or fill.
- (m) Pipelines, cables and utility crossings requiring only incidental dredging.
- (n) Installation of tidegates in existing functional dikes.
- (o) Bridge crossing support structures and dredging necessary for their installation.

4. Additional Conditional Uses Permitted Subject to Resource Capability Test:

The following uses and their accessory uses may be permitted subject to the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.1699, and 1.1901 to 1.1999, the Special Policies of the applicable Management Unit, and the provisions of subsection (7) of this section:

- (a) High intensity water dependent recreation, including, but not limited to, boat ramps and marinas, and including new and maintenance dredging for such uses.
- (b) Other water dependent uses requiring the occupation of estuarine surface area by means other than fill
- (c) Minor navigational improvements.
- (d) Mining and mineral extraction, including dredging necessary for such extraction.
- (e) Aquaculture requiring dredge, fill or other alteration of estuarine aquatic area.

(f) Temporary alterations.

5. Special Standards

Dredging, filling or other alterations of the estuary shall be allowed only:

- (a) In conjunction with a use authorized in accordance with subsections (3) and (4) of this section;
- (b) If a need (i.e., a substantial public benefit) is demonstrated;
- (c) If the use or alteration does not substantially interfere with public trust rights;
- (d) If no feasible alternative upland locations exist; and
- (e) If adverse impacts are minimized.

6. Impact Assessment

All decisions authorizing uses in the E-C zone that involve alterations of the estuary that could affect the estuary's physical processes or biological resources shall include a written impact assessment. The impact assessment need not be lengthy or complex. The level of detail and analysis should be commensurate with the scale of expected impacts. For example, for proposed alterations with minimal estuarine disturbance, a correspondingly simple assessment is sufficient. For alterations with the potential for greater impact, the assessment should be more comprehensive. In all cases it shall provide a summary of the impacts to be expected. It should be submitted in writing to the local jurisdiction. It shall include:

- (a) The type and extent of alterations to be authorized;
- (b) The type of resources affected;
- (c) The expected extent of impacts on water quality and other physical characteristics of the estuary, biological resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary;
- (d) The expected extent of impacts of the proposed alteration should reference relevant Climate Vulnerabilities as described in applicable sub-area(s) and management (applicants are encouraged to document the use of any applicable data and maps included in the inventory such as sea level rise and landward migration zones) when considering future:
 - i. continued use of the proposed alteration given projected climate change impacts
 - ii. water quality and other physical characteristics of the estuary,
 - iii. living resources,
 - iv. recreation and aesthetic use,
 - v. navigation, and
 - vi. other existing and potential uses of the estuary; and
- (e) Methods to be employed to avoid or minimize adverse impacts.

7. Conditional Use Requirements:

- (a) All conditional uses in the E-C zone shall comply with the following standards:
 - i. The use is consistent with the management objective of the individual management unit; and
 - ii. The use complies with any applicable Special Policies of the individual Management Unit.

8. Additional Requirements for Conditional Uses Subject to Resource Capability Test:

In addition to all other applicable provisions of this section, conditional uses set forth in subsection (4) of this section are subject to the following requirements:

- (a) The use shall be consistent with the purposes of the Conservation Management Unit classification;
- (b) The use shall be consistent with the resource capabilities of the area. A use is consistent with the resource capabilities of the area when:
 - i. The negative impacts of the use on estuarine species, habitats, biological productivity and water quality are not significant; or
 - ii. The resources of the area are able to assimilate the use and its effects and continue to function in a manner which conserves long-term renewable resources, natural biological productivity, recreational and aesthetic values and aquaculture.

Section XXX Estuary Development Zone E-D

In an E-D zone the following regulations shall apply:

1. Application:

The provisions of the E-D zone shall apply to those estuarine aquatic areas within the boundaries of Development Management Units as designated in the Lincoln County Estuary Management Plan. As used in this section, "estuarine aquatic area" means estuarine waters, submerged lands, tidelands and tidal marshes up to Mean Higher High Water or the line of non-aquatic vegetation, whichever is further landward.

2. Conditional Uses Permitted:

The following uses may be permitted subject to the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.699, and 1.1901 to 1.1999:

- (a) High intensity water dependent recreational uses including, but not limited to, boat ramps, marinas and similar facilities.
- (b) Water dependent commercial uses.
- (c) Water dependent industrial uses.
- (d) Marine terminals.
- (e) Commercial boat basins and similar moorage facilities.
- (f) Navigation activities and improvements.
- (g) In-water disposal of dredged material
- (h) Water storage of products used in industry, commerce or recreation.

3. Additional Conditional Uses Permitted Subject to Management Unit Purpose:

The following uses and their accessory uses may be permitted subject to the provisions of subsection (8) of this section and the applicable provisions of LCC 1.1401 to 1.1499, 1.1501 to 1.599, 1.1601 to 1.699, and 1.1901 to 1.1999:

- (a) Undeveloped low intensity recreation.
- (b) Research and educational observations.
- (c) Navigation aids such as beacons and buoys.

- (d) Projects for the protection of habitat, nutrient, fish, wildlife and aesthetic resources.
- (e) Passive restoration.
- (f) On-site maintenance of existing functional tidegates and associated drainage channels, including, as necessary, dredging and bridge crossing support structures.
- (g) Riprap for the protection of uses not permitted in the E-D zone that were existing as of October 7, 1977.
- (h) Riprap for the protection of unique resources, historical and archeological values and public facilities.
- (i) Communication facilities.
- (j) Active restoration of fish and wildlife habitat, water quality, or estuarine productivity.
- (k) Pipelines, cables and utility crossings.
- (l) Installation of tidegates in existing functional dikes.
- (m) Bridge crossings, including support structures and dredging necessary for their installation.
- (n) Mining and mineral extraction.
- (o) Aquaculture.
- (p) Temporary alterations.
- (q) Water related and non-water related commercial and industrial uses not requiring dredge or fill.

4. Aquatic Area Alterations Permitted:

Subject to the requirements of subsection (5) of this section, the following types of aquatic area alterations may be permitted in conjunction with the development and conduct of uses set forth in subsection (2) and (3) of this section:

- (a) Dredging, except that dredging is not permitted in conjunction with water related or non-water related commercial and industrial uses permitted pursuant to subsection (3)(q) of this section.
- (b) Fill, except that fill is not permitted in conjunction with water related or non-water related commercial and industrial uses permitted pursuant to subsection (3)(q) of this section.
- (c) In-water structures, including but not limited to pilings, dolphins, docks, piers, wharfs, breakwaters, groins, jetties and similar structures.
- (d) Shoreline stabilization including riprap, bulkheads and similar structures.

5. Special Standards:

Dredging, filling or other alterations of the estuary shall be allowed only:

- (a) In conjunction with a use authorized in accordance with subsections (3) and (4) of this section, except that dredging and/or filling is not permitted in conjunction with water related or non-water related commercial and industrial uses permitted pursuant to subsection (3)(q) of this section;
- (b) If a need (i.e., a substantial public benefit) is demonstrated;
- (c) The use or alteration does not substantially interfere with public trust rights;
- (d) If no feasible alternative upland locations exist; and
- (e) If adverse impacts are minimized.

6. Impact Assessment:

All decisions authorizing uses in the E-D zone that involve alterations of the estuary that could affect the estuary's physical processes or biological resources shall include a written impact assessment. The impact assessment need not be lengthy or complex. The level of detail and analysis should be commensurate with the scale of expected impacts. For example, for proposed alterations with minimal estuarine disturbance, a correspondingly simple assessment is sufficient. For alterations with the potential for greater impact, the assessment should be more comprehensive. In all cases it shall provide a summary of the impacts to be expected. It should be submitted in writing to the local jurisdiction. It shall include:

- (a) The type and extent of alterations to be authorized;
- (b) The type of resources affected;
- (c) The expected extent of impacts on water quality and other physical characteristics of the estuary, biological resources, recreation and aesthetic use, navigation and other existing and potential uses of the estuary;
- (d) The expected extent of impacts of the proposed alteration should reference relevant Climate Vulnerabilities as described in applicable sub-area(s) and management unit (applicants are encouraged to document the use of any applicable data and maps included in the inventory such as sea level rise and landward migration zones) when considering future:
 - i. continued use of the proposed alteration given projected climate change impacts
 - ii. water quality and other physical characteristics of the estuary,
 - iii. living resources,
 - iv. recreation and aesthetic use,
 - v. navigation, and
 - vi. other existing and potential uses of the estuary; and
- (e) Methods to be employed to avoid or minimize adverse impacts.

7. Conditional Use Requirements:

All conditional uses in the E-D zone shall comply with the following standards:

- (a) The use is consistent with the management objective of the individual management unit; and
- (b) The use complies with any applicable Special Policies of the individual management unit.

8. Additional Requirements for Conditional Uses Subject Management Unit Purpose:

In addition to all other applicable provisions of this section, conditional uses set forth in subsection (3) of this section are subject to the following requirements:

- (a) The use shall be consistent with the purposes of the Development Management Unit classification;
- (b) The use shall be consistent with the designation of adjacent shorelands, including where such shorelands are reserved for water dependent uses, or designated for waterfront redevelopment.

APPENDIX G – CMECS DATA DESCRIPTIONS

New appendix proposed as part of the 2023 update

The following is descriptive information on the various types of estuarine natural conditions from the CMECS dataset. The CMECS dataset was utilized to develop Inventory Maps 7 – 12.

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CMECS Biotic Codes

CODE	SETTING	CLASS	SUBCLASS	GROUP
2.5	Benthic/Attached	Aquatic Vegetation Bed		
<p>This class includes subtidal or intertidal bottoms and any other areas characterized by a dominant cover of rooted vascular plants, attached macroalgae, or mosses, which are usually submersed in the water column or floating on the surface. They may be exposed during low tides. Non-rooted floating vegetation and free floating macroalgae are included with the Planktonic Biota Biotic Setting under the Floating/Suspended Plants and Macroalgae Subclass.</p>				
2.5.1	Benthic/Attached	Aquatic Vegetation Bed	Benthic Macroalgae	
<p>Aquatic beds dominated by macroalgae attached to the substrate, such as kelp, intertidal fucoids, and calcareous algae. Macroalgal communities can exist at all depths within the photic zone, on diverse substrates, and across a range of energy and water chemistry regimes. In the CMECS framework, macroalgae that dominate the benthic environment and form a vegetated cover fall within this subclass.</p>				
2.5.2	Benthic/Attached	Aquatic Vegetation Bed	Aquatic Vascular Vegetation	
<p>Aquatic vascular vegetation beds dominated by submerged, rooted, vascular species (such as seagrasses) or submerged or rooted floating freshwater tidal vascular vegetation (such as hornworts [<i>Ceratophyllum</i> spp.] or naiads [<i>Najas</i> spp.]).</p>				
2.5.2.1	Benthic/Attached	Aquatic Vegetation Bed	Aquatic Vascular Vegetation	Seagrass Bed
<p>Tidal aquatic vegetation beds dominated by any number of seagrass or eelgrass species, including <i>Cymocedea</i> sp., <i>Halodule</i> sp., <i>Thalassia</i> sp., <i>Halophilla</i> sp., <i>Vallisneria</i> sp., <i>Ruppia</i> sp., <i>Phyllospadix</i> sp., and <i>Zostera</i> sp. Seagrass beds may occur in true marine salinities, and they may extend into the lower salinity zones of estuaries.</p> <p>Seagrass beds are complex structural habitats that provide refuge and foraging opportunities for abundant and diverse faunal communities in shallow waters. Seagrass beds require a specific set of ecological conditions for success, and they are generally perceived as areas of high environmental quality.</p>				
2.6	Benthic/Attached	Emergent Wetland		
<p>Areas in this class are characterized by erect, rooted, herbaceous hydrophytes—excluding emergent mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.</p>				
2.6.1	Benthic/Attached	Emergent Wetland	Emergent Tidal Marsh	
<p>Communities dominated by emergent, halophytic, herbaceous vegetation (with occasional woody forbs or shrubs) along low-wave-energy, intertidal areas of estuaries and rivers. Vegetation in this subclass is composed of emergent aquatic macrophytes, especially halophytic species—chiefly graminoids (such as rushes, reeds, grasses and sedges), shrubs, and other herbaceous species (such as broad-leaved emergent macrophytes, rooted floating-leaved and submergent species [aquatic vegetation], and macroscopic algae). The vegetation is usually arranged in distinct zones of parallel patterns, which occur in response to gradients of tidal flooding frequency and duration, water chemistry, or other disturbances.</p> <p>Tides may expose mudflats that contain a sparse mix of pioneering forb and graminoid species. Salinity levels (which control many aspects of salt-marsh chemistry) vary depending on a complexity of factors, including frequency of inundation, rainfall, soil texture, freshwater influence, fossil salt deposits, and more. Salt marshes often grade into (or are intermixed with) scrub-shrub wetlands in higher areas.</p>				

CODE	SETTING	CLASS	SUBCLASS	GROUP
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2.6.1.1	Benthic/Attached	Emergent Wetland	Emergent Tidal Marsh	Brackish Mars
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Marshes dominated by species with a wide range of salinity tolerance. Depending on the salinity levels (0.5-30), more or less salt-intolerant species may be present.

2.7	Benthic/Attached	Scrub-Shrub Wetland		
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Emergent wetland areas dominated by woody vegetation that is generally less than 6 meters tall. Characteristic species include true shrubs, young trees, and trees or shrubs that are small or stunted due to environmental conditions. Scrub-Shrub Wetland includes the shrub-dominated portions of high salt marshes—as well as stunted or low mangrove communities.

2.7.1	Benthic/Attached	Scrub-Shrub Wetland	Tidal Scrub-Shrub Wetland	
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Estuarine or tidal riverine areas dominated by shrub vegetation that has less than 10% tree cover.

2.7.1.1	Benthic/Attached	Scrub-Shrub Wetland	Tidal Scrub-Shrub Wetland	Brackish Tidal
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Tidal areas dominated by shrub or immature tree species that are less than 6 meters tall and have a range of salt tolerance. Salinity may range from 0.5-30 (PSS).

2.8	Benthic/Attached	Forested Wetland		
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Areas in this class are characterized by woody vegetation that is generally 6 meters or taller.

2.8.1	Benthic/Attached	Forested Wetland	Tidal Forest/Woodland	
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Estuarine or tidal riverine areas with greater than 10% tree cover.

CMECS Aquatic Codes

CODE	SYSTEM	SUBSYSTEM	TIDALZONE
2	Estuarine		
<p>The Estuarine System is defined by salinity and geomorphology. This System includes tidally influenced waters that (a) have an open-surface connection to the sea, (b) are regularly diluted by freshwater runoff from land, and (c) exhibit some degree of land enclosure.</p> <p>The Estuarine System extends upstream to the head of tide and seaward to the mouth of the estuary. Head of tide is identified in accordance with the Metadata Profile for Shoreline Data, FGDC-STD-001.2-2001 (FGDC 2001) as the inland or upstream limit of water affected by a tide of at least 0.2 foot (0.06 meter) amplitude. The mouth of the estuary is defined by an imaginary line connecting the seaward-most points of land that enclose the estuarine water mass at MLLW. Islands are included as headlands if they contribute significantly to the enclosure.</p>			
2.1	Estuarine	Estuarine Coastal	
<p>The Estuarine Coastal Subsystem extends from the supratidal zone at the land margin up to the 4 meter depth contour in waters that have salinity greater than 0.5 (during the period of average annual low flow). The Estuarine Coastal Subsystem would be considered the shallow perimeter in a deeper estuary, although many estuaries may be entirely less than 4 meters deep and be classified as completely in the Coastal Subsystem. The 4 meter contour was selected as a cutoff between "coastal" and "offshore" estuarine waters because it identifies (somewhat arbitrarily) a region that is both shallow and generally in close proximity to the shore, making the substrate-to-water volume ratio here the highest in the entire estuary.</p>			
2.2	Estuarine	Estuarine Open Water	
<p>The Estuarine Open Water Subsystem includes all waters of the Estuarine System with a total depth greater than 4 meters, exclusive of those waters designated Tidal Riverine Open Water.</p> <p>The Open Water Subsystem is subject to a number of physical factors that make it distinct from the Coastal Subsystem, including reduced air-water exchange, potentially reduced light at depth, reduced physical impact from waves and surface currents and reduced interaction between the water column and the bottom. Moreover, because of the formation of stratified layers in the Estuarine System, the Open Water Subsystem is often "capped" by a relatively strong density or stability gradient that distinctly separates the lower water column from the upper water column, separated by a zone of transition (such as a pycnocline, halocline, or thermocline).</p>			
2.2.1	Estuarine	Estuarine Open Water	Estuarine Open Water
<p>The substrate is generally continuously submerged in this zone and includes those areas below MLLW.</p>			
2.3	Estuarine	Estuarine Tidal Riverine Coa	
<p>The Estuarine Tidal Riverine Coastal Subsystem includes the most upstream region of the estuary, in those areas between MHHW to the 4 meter depth contour below MLLW in waters that (a) can be regularly influenced by tides and (b) where salinity is below 0.5 during the period of annual low flow. The areas with this salinity may extend upriver to the head of tide, which is identified as the point where the mean tidal range becomes less than 0.2 feet (0.06 meters) (FGDC 2001).</p> <p>The Tidal Riverine Coastal Subsystem includes upstream areas that are influenced by ocean tides, but do not experience significant salinity. The hydraulic gradient is low and water stage and velocity fluctuate under tidal influence. Water is always present and is confined within a channel, and is usually flowing. The Tidal Riverine Coastal Subsystem is a critical part of the ecology and habitat of the estuary. This area is the site of significant ecological activity and a number of estuarine and coastal species depend on Tidal Riverine Coastal areas for breeding habitats, nursery habitats, and migratory pathways (e.g., striped bass, wading birds, and anadromous fishes). The Tidal Riverine Coastal Subsystem also supports unique hydrological features, for example the Estuarine Turbidity Maximum, tidal bores and Coriolis deflections.</p>			

CMECS Geoform Codes

CODES	TECTONIC and PHYSIOGRAPHIC PROVINCE	ORIGIN	GEOFORM	TYPE
t2	Convergent Active Continental			
				<p>Intense areas of active magmatism, where the oceanic lithosphere is subducted beneath the continental lithosphere. This results in chains of volcanoes near the continental margin; the leading edge of the continental plate is usually studded with steep mountain ranges.</p>
p9	Embayment/Bay			
				<p>A water body with some level of enclosure by land at different spatial scales. These can be wide, curving indentations in the coast, arms of the sea, or bodies of water almost surrounded by land. These features can be small—with considerable freshwater and terrestrial influence—or large and generally oceanic in character.</p>
p12	Lagoonal Estuary			
				<p>This class of estuary tends to be shallow, highly enclosed, and have reduced exchange with the ocean. They often experience high evaporation, and they tend to be quiescent in terms of wind, current, and wave energy. Lagoonal estuaries usually have a very high surface-to-volume ratio, a low-to-moderate watershed-to-water-area ratio, and can have a high wetland-to-water ratio. The flushing times tend to be long relative to riverine estuaries and embayments because the restricted exchange with the marine-end member and the reduced river input lengthen residence times. As such, there tends to be more benthic-pelagic interaction, enhanced by generally shallow bathymetry. Additionally, exchange with surrounding landscapes (often riparian wetland and palustrine systems) tends to be enhanced and more highly coupled than in other types of estuaries.

Occasionally, a lagoon may be produced by the temporary sealing of a river estuary by a barrier. Such lagoons are usually seasonal and exist until the river breaches the barrier; these lagoons occur in regions of low or sporadic rainfall.</p>

p16 Riverine Estuary

This class of estuary tends to be linear and seasonally turbid (especially in upper reaches), and it can be subjected to high current speeds. These estuaries are sedimentary and depositional, so they may be associated with a delta, bar, barrier island, and other depositional features. These estuaries also tend to be highly flushed (with a wide and variable salinity range) and seasonally stratified. Riverine estuaries have moderate surface-to-volume ratios with a high watershed-to-water-area ratio—and they can have very high wetland-to-water-area ratios as well. These estuaries are often characterized by a V-shaped channel configuration and a salt wedge.
High inputs of land drainage can promote increased primary productivity, which may be confined to the water column in the upper reach, due to low transparency in the water column. Surrounding wetlands may be extensive and healthy, given the sediment supply and nutrient input. This marsh perimeter may be important in taking up the excess nutrients that are introduced to the system. Physically, the system may tend to be stratified during periods of high riverine input, and the input of marine waters may be enhanced by countercurrent flow.

o1 Geologic

Geologic geofoms are formed by the abiotic processes of uplift, erosion, volcanism, deposition, fluid seepage, and material movement. Uplift may be a result of local and regional seismic and tectonic processes. Waves, currents, wind, chemical dissolution, seismic motion, and chemical precipitation all contribute to these geofoms and give them their distinctive qualities.

g109 Channel

A general term for a linear or sinuous depression on an otherwise more flat area (for example, a valley- or groove-like feature through which water flows). This is a very broad term that is often used in connection with other terms to provide more meaning.

g10903 Channel Slough

(a) A sluggish body of water in a tidal flat, bottomland, or coastal marshland; may also be called bayous or oxbows.
(b) A sluggish channel of water (such as a side channel of a river) in which water flows slowly through either low, swampy ground (such as along the Columbia River) or a section of an abandoned river channel (which may contain stagnant water) that occurs in a flood plain or delta.

CODES	TECTONIC and PHYSIOGRAPHIC PROVINCE	ORIGIN	GEOFORM	TYPE
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g121			Fan	
<p>A low, outspread gently to steeply sloping mass of loose material, which is shaped like an open fan or a segment of a cone. Fans are made of material deposited by a flow of water at the place where it issues from a narrower or steeper gradient area into a broader area, valley, flat, or other feature.</p>				

g12103			Fan	Shoreline Fan
<p>A prograding shoreline formed where an alluvial fan is built out into a lake or sea.</p>				

g122			Flat	
<p>A general term for a level (or nearly level) surface or area of land marked by little or no relief; flats are often composed of unconsolidated sediments (such as mud or sand). These forms are more commonly encountered in the intertidal or in the shallow subtidal zones.</p>				

g129			Island	
<p>An area of land completely surrounded by water—or an elevated area of land surrounded by swamp or marsh, which is isolated at high water or during floods.</p>				

g136			Marsh Platform	
<p>The flat, often thick, accumulation of peat that supports emergent marsh vegetation. It is commonly dissected by tidal creeks, and it is occasionally buried and re-exposed through the action of beach erosion and new inlet development.</p>				

CODES	TECTONIC and PHYSIOGRAPHIC PROVINCE	ORIGIN	GEOFORM	TYPE
g141	Natural Levee			An embankment of sediment, bordering one or both sides of a submarine canyon, fan valley, deep-sea channel, river, or other feature. A natural levee has a long, broad, low shape and is composed of sand and coarse silt, which was built by a stream on its flood plain and along both sides of its channel—especially in time of flood when water overflowing the normal banks is forced to deposit the coarsest part of its load. It has a gentle slope away from the river and toward the surrounding floodplain, and its highest elevation is closest to the river bank.
g161	Shore			The intersection of a specified plane of water with the beach that migrates with changes of the tide or of the water level.
o2	Biogenic			Biogenic geofoms are physical features and landforms that were created by the action of living organisms (bioherms). These primarily consist of the different types of reefs. Examples of these generally hard, fixed structures include the incorporation of dissolved calcium carbonate into reef structure by corals, aggregations of mollusk shells into a fixed cohesive substrate, or the cementation of existing sediments into an aggregation of worm tubes. As with all geofoms the characteristic of concern in this component is the physical shape of these reef features, not the living biology that may have participated in their genesis. Any of the reef geofoms may or may not have living coral or other life present.
o3	Anthropogenic			In many coastal and deep oceans, artificial structures (such as piers, breakwaters, bulkheads, berms, drilling rigs, and artificial reefs) are a significant part of the environment. The continually (or intermittently) submerged portions of features attract vagile fauna and provide attachment surfaces for plants and sessile animals. These features can also provide shelter from predators and prevailing current, and they can support niche communities that increase overall biodiversity. However, these structures can also have negative effects (such as altering natural hydrodynamic patterns, interfering with animal movement, and increasing contaminant loading into nearshore areas), and thus are often of interest to resource managers.

CODES	TECTONIC and PHYSIOGRAPHIC PROVINCE	ORIGIN	GEOFORM	TYPE
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g30201			Artificial Dike	Artificial Levee
<p>(a) A dike along the side of a river channel erected to prevent overflow during floods, usually running along the channel direction and near the natural levee crests of streams. (b) An artificial embankment constructed along the bank of a watercourse or an arm of the sea to protect land from inundation (or to confine stream flow to its channel).</p>				

g313			Dock/Pier	
<p>A landing place for vessels normally oriented perpendicular to the shore with a flat surface for off-loading materials. Docks may be fixed in position through anchors or piles, or be supported by pilings or other structures.</p>				

g315			Dredge Deposit	
<p>A subaqueous area that is substantially shallower than the surrounding area, which resulted from the deposition of materials from dredging and dumping.</p>				

g318			Fill Area	
<p>A topographically low area into which unconsolidated material has been placed in order to raise the ground level as part of development or expansion of coastal infrastructure.</p>				

g320			Harbor	
<p>A small bay or a sheltered part of a sea, lake, or other large body of water. A harbor is usually well protected (either naturally or artificially) against high waves and strong currents and serves as a safe anchorage for ships and where port facilities are present. Many smaller anthropogenic geoforms may be encountered within a harbor.</p>				

CODES	TECTONIC and PHYSIOGRAPHIC PROVINCE	ORIGIN	GEOFORM	TYPE
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g323			Marina/Boat Ramp	
<p>A series of docks, walkways, slips, and support infrastructure (such as cables and small pipelines) for in-water storage of yachts and boats. Marinas commonly include one or more boat ramps, which consist of a sloping driveway for launching small, trailered vessels.</p>				

g329			Rip Rap Deposit	
<p>An accumulation of rock or boulders placed along a waterway or shoreline to reduce erosion.</p>				

g30202			Artificial Dike	Breached Dike
<p>A breached, raised, linear barrier intended to contain or hold back water in order to prevent flooding of adjacent land. These may be concrete or fill structures. Breach can be natural or manmade.</p>				

CMECS Substrate Codes

CODE	ORIGIN	CLASS	SUBCLASS	GROUP	SUBGROUP
1.1	Geologic Subs	Rock Substrate			
Igneous, metamorphic, or sedimentary rock with particle sizes greater than or equal to 4.0 meters (4,096 millimeters) in any dimension that cover 50% or greater of the Geologic Substrate surface.					
1.2	Geologic Subs	Unconsolidated Mineral			
Geologic Substrates with less than 50% cover of Rock Substrate. This class uses Folk (1954) terminology to describe any mix of loose mineral substrate that occurs at any range of sizes—from Boulders to Clay.					
1.2.1.2.2	Geologic Subs	Unconsolidated Mineral	Coarse Unconsolidated Substrate	Gravel Mixes	Muddy Sandy Gravel
Geologic Substrate is 30% to < 80% Gravel, with Sand composing from 50% to < 90% of the remaining Sand-Mud mix.					
1.2.1.2.3	Geologic Subs	Unconsolidated Mineral	Coarse Unconsolidated Substrate	Gravel Mixes	Muddy Gravel
Geologic Substrate is 30% to < 80% Gravel, with Mud composing 50% or more of the remaining Mud-Sand mix.					
1.2.2	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate		
Geologic Substrate surface layer contains less than 5% gravel (particles 2 millimeters to < 4,096 millimeters in diameter). These sediments are classified using the bottom two rows of the Folk (1954) Gravel-Sand-Mud diagram, and the entire Folk (1954) Sand-Silt-Clay diagram.					
1.2.2.1.2	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Slightly Gravelly	Slightly Gravelly Muddy Sand
Geologic Substrate is 0.01% to < 5% Gravel, and the remaining Sand-Mud mix is 50% to < 90% Sand.					
1.2.2.1.3	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Slightly Gravelly	Slightly Gravelly Sandy Mud
Geologic Substrate is 0.01% to < 5% Gravel, and the remaining Sand-Mud mix is 50% to < 90% Mud.					
1.2.2.1.4	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Slightly Gravelly	Slightly Gravelly Mud
Geologic Substrate is 0.01% to < 5% Gravel, and the remaining Sand-Mud mix is 90% or more Mud.					
1.2.2.3	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Muddy Sand	
Geologic Substrate surface layer contains no trace of Gravel and is composed of 50% to < 90% Sand (particles 0.0625 millimeters to 2 millimeters in diameter); the remainder is composed of Mud (particles less than 0.0625 millimeters in diameter).					

CODE	ORIGIN	CLASS	SUBCLASS	GROUP	SUBGROUP
1.2.2.4	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Sandy Mud	
Geologic Substrate surface layer contains no trace of Gravel and is composed of 10% to < 50% Sand; the remainder is composed of Mud (particles less than 0.0625 millimeters in diameter).					
1.2.2.5	Geologic Subs	Unconsolidated Mineral	Fine Unconsolidated Substrate	Mud	
Geologic Substrate surface layer contains no trace of Gravel and is composed of 90% or more Mud (particles less than 0.0625 millimeters in diameter); the remainder (< 10%) is composed of Sand (particles 0.0625 millimeters to < 2 millimeters in diameter).					
2	Biogenic Subs				
Substrates where percent cover of non-living Biogenic Substrate exceeds percent cover of both Geologic Substrate and Anthropogenic Substrates, when all are considered separately. Biogenic substrates are classified at the higher levels by taxonomy, and at the lower levels by median particle size.					
3	Anthropogenic				
Substrates where percent cover of Anthropogenic Substrate exceeds percent cover of both Geologic Substrate and Biogenic Substrates, considered separately. Anthropogenic Substrates are classified at the higher levels by composition, and at the lower levels by median particle size.					
3.1	Anthropogenic	Anthropogenic Rock			
Anthropogenic Substrate that is primarily composed of natural mineral materials that were purposefully or accidentally deposited by humans. This includes breakwaters made of natural stone, dredge material, artificial reefs made of natural stone, as well as beach nourishment and beach fill. Shape for this substrate class is covered in the GC (e.g., Groin, Breakwater, and Dredge Deposit). If the origin of a feature cannot be determined, it is assumed to be of natural origin and classified in the Geologic or Biogenic Substrate Origin.					
3.1.2	Anthropogenic	Anthropogenic Rock	Anthropogenic Rock Rubble		
Substrate that is dominated by Anthropogenic Rock with a median particle size of 64 millimeters to < 4,096 millimeters (Cobbles and Boulders).					
3.1.3	Anthropogenic	Anthropogenic Rock	Anthropogenic Rock Hash		
Substrate that is dominated by Anthropogenic Rock with a median particle size of 2 millimeters to < 64 millimeters (Granules and Pebbles).					
3.3	Anthropogenic	Construction Materials			
Anthropogenic Substrate that is composed of any single construction material or combination of construction materials (concrete, brick, rebar, pipe, porcelain, fiberglass, rubber, plastic, < 50% wood, < 50% metal, etc.) that were manufactured by humans. This substrate may be composed of one or many types of these materials. If anthropogenic wood or metal constitute a dominant fraction of the materials, the substrate is classified as Anthropogenic Wood or Metal, accordingly.					