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Strategy Habitat: Estuaries

Ecoregions:

Estuaries are a Strategy Habitat only in the Coast Range ecoregion.

Characteristics:

Estuaries occur where freshwater rivers meet the salty waters of the ocean. They are influenced by tidal flooding, and as such experience frequent changes in salinity, water levels, sunlight, and oxygen. Estuaries have four main subsystems: marine, bay, slough, and riverine. The marine subsystem is at the river's mouth and is dominated by salt-water plants and animals. Bays are characterized by broad mud flats that are alternately covered by water and exposed to the air due to tidal flows. Sloughs are smaller side tributaries with little freshwater input. Sloughs consist of a mosaic of meandering channels, mud flats and salt marshes. The riverine portion of the estuary extends up the river as far as tides influence water flow and salinity. The river forms a single channel that is usually bordered by salt and brackish marshes. Variation in salinity, tidal inundation, and soils influences marsh plant composition and often results in zones of vegetation, primarily grasses, rushes, sedges, and forbs. Major bays in Oregon include the Alsea, Coos, Nehalem, Nestucca, Netarts, Siletz, Tillamook, Yaquina, and Youngs Bays.

Conservation Overview:

This highly complex, productive habitat is critical for many fish and wildlife species, including salmon, crabs and other shellfish, marine mammals and seabirds. By some estimates, estuaries support up to three-quarters of all harvested fish species, and this is largely due to the high productivity of seagrass beds. Seagrasses grow underwater in estuaries and have the highest productivity of any plant. Efforts to maintain and restore estuaries will benefit many wildlife and commercially important species. Strategy Species associated with estuaries include black brant and salt-marsh bird's beak. Estuaries also provide wintering habitat for waterfowl, migration stopover feeding areas for shorebirds, and mineral sources for band-tailed pigeons.

Estuarine habitats have been impacted by human development and uses, such as dredging, hydrologic modifications, and urbanization. Salt-marshes and other tidal wetland types have been diked, drained, and converted to pasture, resulting in substantial habitat loss.

In accordance with state planning laws, local government comprehensive plans and zoning ordinances have been prepared for all of Oregon's estuaries.

Limiting Factors in Estuaries:

By their nature, estuaries are complex systems with many habitat types. The limiting factors listed below focus on the bay, slough, and riverine subsystems of estuaries. The marine subsystem is currently being addressed through the Oregon Nearshore Strategy (in preparation, 2005), a comprehensive approach to marine species and habitat management in Oregon. Additional factors and approaches that could affect estuaries are covered in the freshwater wetlands, riparian, and aquatic sections of this chapter (for example, sedimentation, nutrient input, loss of habitat complexity).

Factor: Increasing development and land use conversions: Estuary habitat has been lost to a variety of causes, including: past diking and drainage; industrial and residential development; and aquaculture practices that reduce eelgrass beds and disturb winter waterfowl.

Approach: Continue to provide incentives to protect, maintain or restore estuaries. Where appropriate, work to remove dikes to restore tidal marshes. Continue successful education programs focused on the function and services provided by estuaries. Work with agency partners to support and implement existing land use regulations that preserve and restore habitats. Continue to develop and refine "best management practices" for aquaculture. Maintain or restore eelgrass beds as a habitat feature.

Factor: Alteration of hydrology: The amount and the timing of freshwater inputs into estuaries are critical in maintaining the hydrological regime that supports the delicate estuarine balance. When either the amount or timing of freshwater input is altered, several results are possible: inundation of floodplains; increased sedimentation; decreased residence time of water, which reduces the filtering benefits of estuaries; altered fish community dynamics; increased stress on juvenile fish, nekton or other animals. Compounding the problem, changes in hydrological regimes can make estuaries prone to invasive species.

Approach: Critically consider the effects of water diversions for other land uses (including agriculture, forestry, or residential use) and reservoir operations. Evaluate the potential impacts of these activities on floodplain dynamics and other functions of estuaries.

Factor: Degraded water quality: Water quality in estuaries is frequently degraded by heavy and varied use. In particular, estuaries are susceptible to increased bacterial loads. Dissolved oxygen levels are often an additional concern. Runoff from residential, agricultural, and forest land, failing septic systems, animal waste, and storm events can affect water quality.

Approach: Continue current efforts to consider impacts on estuarine water quality in land use planning. When necessary, Oregon Department of Environmental Quality develops Total Maximum Daily Loads and water quality management plans involving the input of all interested and affected partners. Continue coordination to ensure that plans and goals consider impacts on wildlife in addition to other goals (i.e., recreation).

Factor: Invasive plants: Common cordgrass and other invasive plant species potentially pose a great threat to Oregon's estuaries. Common cordgrass has been documented in two Oregon estuaries and is well-established in Washington and California. Where it occurs, it reduces mud flat habitats, disrupts nutrient flows, displaces native plants and animals, and traps sediments, which changes the beach profile and water circulation. Three other cordgrass species have invaded the Pacific coast and could potentially pose a threat to estuaries. Estuaries are one of the most vulnerable habitats for invasives due to ship traffic and release of ballast water.

Approach: Emphasize prevention, risk assessment, early detection and quick control to prevent new invasives from becoming fully established. Control key invasive plants using site-appropriate tools such as hand-pulling, covering with geotextile cloth, repeated mowing, flooding, and/or herbicides, focusing on spot treatment. Monitor estuaries for potential invasives, including other cordgrasses, and use site-appropriate methods to control newly-established species for which management can be most effective. Work with partners to implement existing ballast water regulations. Develop methods to treat ballast water.

Factor: Invasive invertebrates: Introduction of invasive marine invertebrates such as the green crab impacts native species, affects estuarine food webs, limits economically important Dungeness crab populations, and impacts mussel, oyster and clam mariculture operations.

Approach: Develop methods to control invasive invertebrate populations. Continue existing efforts to prevent further introductions and to inform the public about green crabs and other invasives.

Factor: Coordination of management: Many jurisdictions and agencies have management authority and interest in estuaries, which can make management more complex and difficult. In Oregon, several agencies (including Oregon Department of State Lands, Water Resources Department, and Department of Land and Conservation and Development) are responsible for estuary management, and many other agencies and organizations have strong interests in estuaries.

Approach: Coordination among agencies is a high priority. Because estuarine issues are complex, clear identification and communication of conservation issues should precede management actions, ensuring that all interests are considered.

Factor: Loss of habitat complexity: Whole, large-diameter trees that used to wash down major rivers during floods provided perches, wind protection, shade, and hiding places in estuaries for different species at different tide levels. These trees lasted many years. Reduced acreage of late successional conifer forest and barriers to water flows on some rivers have restricted new inputs of large-diameter logs. Additionally, wood has been removed for navigation, firewood and industrial use.

Approach: Use cooperative efforts and incentives to promote large-wood management in streams.

Collaborative conservation: Salt marsh restoration and the Tillamook Estuary Project

The word Tillamook means "land of many waters" in Chinook. Tillamook Bay is where several rivers - including the Miami, Kilchis, Trask, Wilson, and Tillamook - empty into the Pacific Ocean. The bay provides vital stopover habitat for waterfowl and shorebirds migrating along the Oregon Coast, and for wintering waterfowl. The bay also supports some of Oregon's most valued populations of chum, coho, and chinook salmon, which nourish and rear their young in the estuary. These water-

fowl and fish greatly benefit from protection, restoration and enhancement of vulnerable estuarine habitats. Successful restoration in estuaries often focuses on re-establishing historic hydrologic regimes. Because estuaries are natural buffers between coastal communities and storms, activities that restore estuarine habitats can also benefit communities. Therefore, carefully planned estuary restoration can greatly benefit fish, wildlife and community development. To ensure mutual benefits from restoration activities, close cooperation and communication among interests is essential. The Tillamook Estuaries Partnership (TEP) is a non-profit organization and designated National Estuary Project that strives to ensure collaborative enhancement of vital estuarine and upland habitats.

One example of TEP's collaborative approach to floodplain restoration is a wetlands acquisition project that allowed Tillamook County to acquire 375 acres of diked former tidelands at the confluence of the Wilson and Trask Rivers (on the upper end of Tillamook Bay). The wetlands project was very collaborative, involving many agencies and private partners. USFWS Coastal Wetland Planning, Protection, and Restoration Act (CWPRA) and NOAA Coastal and Estuarine Land Conservation Program (CELCP) grants funded the purchase, with the Oregon Watershed Enhancement Board providing matching state funds. The Trust for Public Lands undertook all landowner negotiations. TEP facilitated a management committee that developed a plan to guide restoration, monitoring, financing, and public access to the acquired properties. Tillamook County implements the plan and manages the restoration projects. Local stakeholders, including TEP, Oregon Department of Fish and Wildlife, the City of Tillamook, the Tillamook Bay Estuary and Habitat Improvement District, TC Soil and Water Conservation District, and Tillamook County, regularly meet to advise the county. With the help of this advisory committee, Tillamook County is managing the property to restore tidal wetlands and water quality while ensuring long-term habitat protection. In other activities, TEP helped the City of Tillamook acquire inter-tidal wetlands along Hoquarton Slough with the goal of long-term habitat conservation. TEP also undertakes an aggressive fish passage improvement program focused on tidegate and culvert replacements. TEP's Backyard Planting Program (funded by ODFW, OWEB, USFWS, and DEQ) recruits volunteer landowners to remove invasive species and re-plant native vegetation along their riparian buffers. In these and other activities, TEP continues to convene cities, state and federal agencies, and private organizations to enhance and restore estuarine habitat for fish and wildlife, ensuring careful evaluation and implementation of restoration options.

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