COASTAL DUNES

ECOREGIONS

Coastal dunes are a Key Habitat in the Coast Range ecoregion.

CHARACTERISTICS

The Coastal Dunes Key Habitat includes beaches, foredunes, sand spits, deflation plains, and sand dunes, from active dunes to stabilizing back dunes. The vegetation varies from sparse to forested, as influenced by sand scour, deposition, movement, and erosion. Species composition is also influenced by salt spray, storm tidal surges, wind abrasion, and substrate stability. Beaches and sandspits are directly impacted by tidal action and are unvegetated. Foredunes generally have unstable sand and sparse to moderate vegetative cover, including native beachgrass, seashore bluegrass, gray beach peavine, largehead sedge, beach morning glory, yellow sand verbena, and silver beachweed.

In dunes with greater sand stability, red fescue, seashore lupine, beach pea, coastal strawberry, dune tansy, beach knotweed, and pearly everlasting are dominant. Over time, with plant succession, dunes convert to coastal prairies and grasslands, then to shrublands dominated by salal, and evergreen huckleberry, and eventually to forests dominated by shore pine, Sitka spruce, western hemlock, and Douglas-fir.

CONSERVATION OVERVIEW

Coastal dune communities have been altered dramatically through the introduction and spread of non-native European beachgrasses, which outcompetes native vegetation and stabilizes foredunes. The stabilized foredunes block movement of sand inland and artificially accelerate plant succession toward shrubland and forest. Dunes artificially stabilized by non-native beachgrasses have contributed to commercial and residential development of sandy habitats that were once naturally active, shifting shoreline ecosystems. In Oregon, approximately 90 percent of coastal dunes have been altered from their natural state since 1850.

Species living in coastal dune habitats prefer open, sandy environments with a high degree of disturbance from winds and tides. Species of Greatest Conservation Need associated with coastal dunes include the western snowy plover, pink sand verbena, Wolf's evening primrose, silvery phacelia, seaside gilia, and Siuslaw hairy-necked tiger beetle. Dune habitats that have been converted to shrublands and forest do offer habitat for coastal martens.

LIMITING FACTORS AND RECOMMENDED APPROACHES

Limiting Factor: European Beachgrass and other Invasive Plants

European beachgrass stabilizes dunes, resulting in changes in vegetative communities and loss of open sandy habitats that are vital to native species. Stabilized dunes are vulnerable to invasive non-native species, such as European and hybrid beachgrasses, Scotch broom, and gorse, which displace native plants and animals and accelerate succession.

Recommended Approach

Use mechanical and chemical treatment to control European beachgrass in priority areas, such as western snowy plover nesting areas and near pink sand verbena populations. Build on existing restoration efforts to control beachgrass. Control key invasive non-native plants using site-appropriate tools, such as mechanical (e.g., mowing, girdling, hand-pulling), chemical, and biocontrol (for gorse) treatments.

Limiting Factor: Increasing Development

Stabilized dunes are being developed for residential housing which leads to habitat loss and increased direct/indirect impacts to wildlife through disturbance.

Recommended Approach

Use voluntary cooperative approaches, such as financial incentives, Candidate Conservation Agreements with Assurances, and conservation easements to maintain dune habitats. Work with agency partners to support and implement Statewide Land Use Goal 18, "Beaches and Dunes".

Limiting Factor: Recreational Impacts

In some areas, recreational use can disturb wildlife (e.g., western snowy plover nesting areas). Off-highway vehicles can also impact vegetation and disturb wildlife.

Recommended Approach

Work with land managers to direct recreational use away from highly sensitive areas. Provide recreational users with information on coastal dune conservation issues and low impact uses.

HABITAT CHANGE TRENDS ANALYSIS

Using the best available sources for distribution of historic and modern coastal dunes in Oregon, Institute of Natural Resources (INR) compared the total coastal dune area in each map, calculating the percent change between 1855 – 1910 and 2016. They also looked at where changes occurred and calculated the spatial overlap between the maps.

Total Area of Coastal Dunes

The left three columns show the total acres of coastal dune acres in 1855 – 1910, 1998, and 2016 and right three columns show the percent change between the mapping efforts

Mapped Acres			Percent Change		
1855 – 1910	**1998**	**2016**	**1855 to 1998**	**1998 to 2016**	**1855 to 2016**
42,131	43,348	32,009	3%	-26%	-24%

This analysis suggests a loss of 24% of the historic coastal dunes between 1910 and 2016. Only 38% of the areas that were mapped as coastal dunes in the 1855 – 1910 composite vegetation map were also mapped as open dunes in 2016. While some of this is due to offsets in locating the narrow coastal beaches, there do appear to have been significant shifts in where open dunes are located, with some dunes now stabilized and open sand dunes established where vegetation was previously stabilized.

REFERENCES

- Brunner, R. and E. Gaines. 2025. Oregon Vegetation Change 1851-2023. Trends analysis conducted for Oregon Department of Fish and Wildlife. Institute for Natural Resources, Portland State University, Portland, OR, USA.
- Weidemann, A.M., Dennis, L.J., and Smith, F.H. 1999 (New Edition). *Plants of Oregon Coastal Dunes* (new edition). Oregon State University Press, 120 p.

RESOURCES FOR MORE INFORMATION

- Oregon Coastal Management Program
- Oregon Dunes National Recreation Area Management Plan