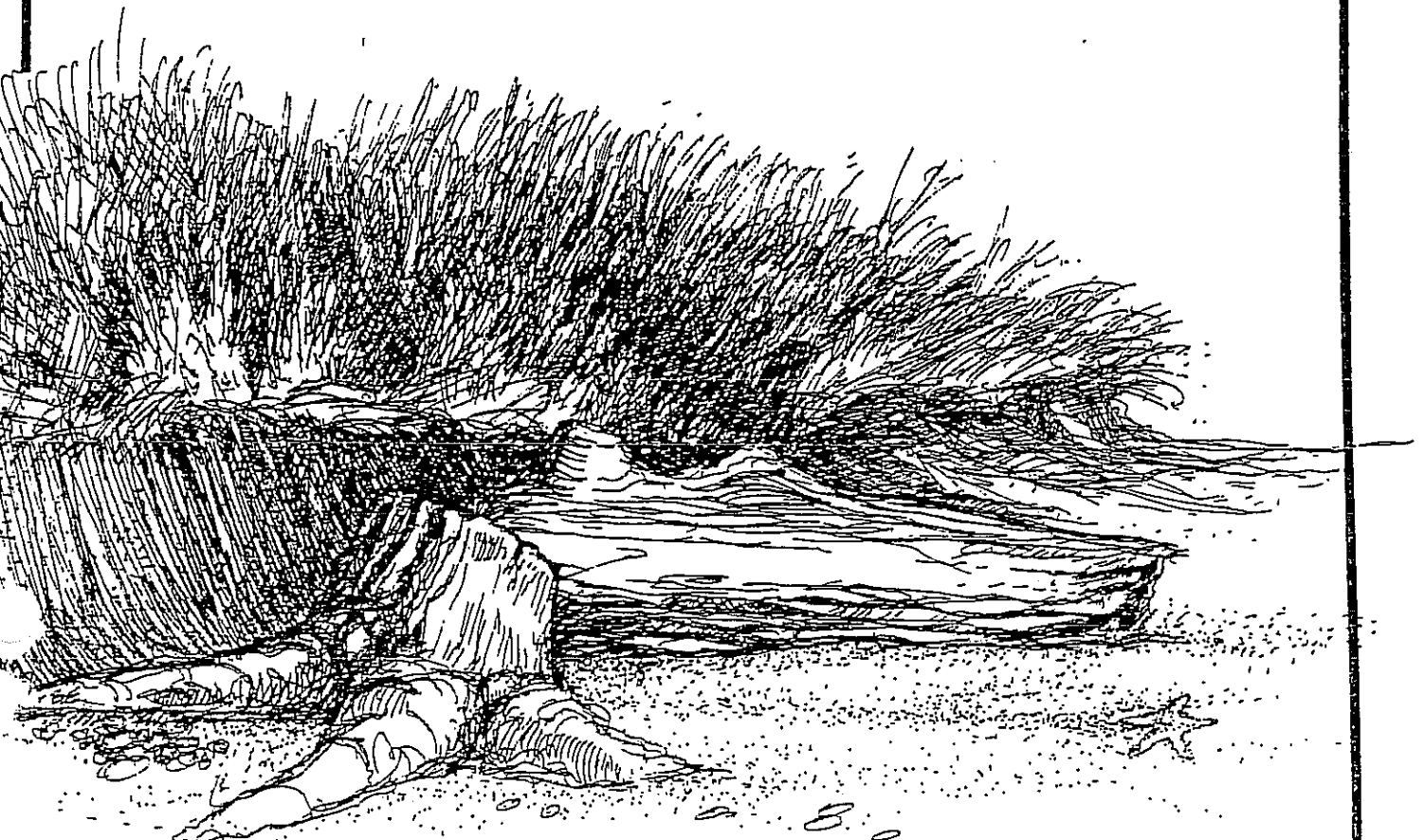


## Goal 18

**CLATSOP COUNTY  
GOAL 18  
COUNTY-WIDE ELEMENT**

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**BEACHES & DUNES**



## Goal 18 - Beaches and Dunes

### Goal 18

To conserve, protect, where appropriate develop, and where appropriate restore the resources and benefits of coastal beach and dune areas; and

To reduce the hazard to human life and property from natural or man-induced actions associated with these areas.

### Beaches and Dunes Policies

1. Uses permitted on the beach, the area located west of the statutory Vegetation Line as established and described by ORS 390.770, or the line of established upland shore vegetation, whichever is further inland, shall be consistent with the requirements ORS 390.605 - 390.725 and Oregon Administrative Rules adopted pursuant thereto. Residential development and commercial and industrial buildings are prohibited. The County will coordinate its actions in beach areas with the Oregon Department of Parks and Recreation.
2. Uses permitted on active foredunes, on other foredunes which are conditionally stable and are subject to ocean undercutting or wave overtopping, and on interdune areas (deflation plains) that are subject to ocean flooding shall be limited to low intensity uses which have minimal impact on the dune system and which have a minimal monetary value. Residential developments and commercial and industrial buildings are prohibited.
3. The County, in making land use decisions in beach and dune areas, other than older stabilized dunes, shall consider the impact of the proposed development on the site and on adjacent areas, and the methods that are proposed for protecting the site and adjacent areas from any potential adverse effects of the proposed development.
4. The stability of all types of dunes, in relationship to the potential for wind erosion, is based on the maintenance of its vegetative cover. For this reason, the county shall implement a wind erosion control program that minimizes site disturbance, provides for temporary and permanent sand stabilization, and requires the continued maintenance of newly established vegetation.
5. On active and conditionally stable dunes, pedestrian, bicycle, equestrian and vehicular circulation shall be managed to minimize adverse impacts to dunes and their stabilizing vegetation
6. Land use actions (i.e. Comprehensive Plan changes, zone changes, subdivisions and partitions, planned developments, conditional use permits) shall be reviewed by the Planning Commission or the Department of Planning and Development so that the

proposed activity(ies) will not result in the drawdown of the groundwater supply which could lead to any or all of the following:

- a. the loss of stabilizing vegetation,
  - b. the loss of water quality,
  - c. salt water intrusion into the water supply,
  - d. result in the permanent drawdown of the dune lakes.
7. Foredunes shall be breached only on a temporary basis for emergency purposes such as fire control, cleaning up oil spills, or alleviating flood hazards. Breaches in foredune areas shall be restored in a manner that is consistent with the character of the area prior to the foredune breaching.
  8. Foredune grading for view enhancement or to prevent on-going sand inundation may be allowed for structures in foredune areas that were committed to development on or before January 1, 1977 and where an overall plan for managing the foredune grading is prepared. Before construction can begin, the foredune grading plan must be adopted as an amendment to the Comprehensive Plan.
  9. The extensive modification of dune areas other than that permitted by an approved plan for foredune grading for view enhancement, is strongly discouraged because the shape of unmodified dune forms is an essential element in defining the physical character of the Clatsop Plains.
  10. Clustering of development is encouraged so that development occurs on the most stable dune areas, with less stable areas retained as open space.
  11. The County will provide for the appropriate management of dune areas within Fort Stevens State Park through the adoption of the Fort Stevens State Park Master Plan.
  12. Removal of vegetation which provides wildlife habitat shall be limited. Unnecessary removal of shoreline vegetation shall be prohibited.
  13. In order to establish construction feasibility, within the dune construction area, and to provide recommendations on methods to mitigate potentially hazardous conditions, a site specific investigations by registered professional geologist or certified engineering geologist shall be required for the issuance of a development permit in all beach and dune areas that the Planning Director considers to have a hazard potential.
  14. On-site sewage disposal systems shall be prohibited in active foredunes, on other foredunes which are conditionally stable and are subject to ocean undercutting or wave overtopping, and on interdune areas (deflation plains) that are subject to ocean flooding
  15. Beachfront protective structures shall be permitted only where development existed on or before January 1, 1977.

16. Where appropriate, developers may be required to dedicate easements for public access to the beach.
17. The county supports studies designed to increase scientific knowledge about the processes that have shaped and will continue to shape the dunes of the Clatsop Plains.

#### Beaches and Dunes Recommended Actions

1. To avoid desiccation of the groundwater lakes and encroachment of sea water, a water management program which is consistent with the water budget equation for the Clatsop Plains should be developed. The County should request technical and financial assistance from state and federal agencies in evaluating water development potentials.
2. The County, in cooperation with other local jurisdictions, should consider a cost/benefit comparison of developing the Clatsop Plains aquifer as a water source with other sources of water supply.

BACKGROUND REPORT & EXCEPTIONS

GOAL 18

BEACHES AND DUNES

Adopted January 3, 1979 Ordinance 78-25  
Amended by Ordinance 03-08

BACKGROUND (INVENTORY) DATA  
GOAL 18

1. Geology

Bedrock in the Clatsop Plains area is the Astoria Formation. This unit is Oligocene to late Miocene in age and includes sandstone and silty shale massive to cross-bedded, with gentle westerly dips and extensive faulting, as well as local intrusions (Beaulieu, 1971). The unit is "fine grained < tightly compacted, and relatively impermeable (Frank, 1970). This bedrock underlies the Clatsop Plains sand dune area as a depth of 125 to over 400 feet. This same bedrock unit also underlies the hills to the east of the Clatsop Plain.

2. Beach and Dune Formation, Accretion, Erosion and Migration

The report titled "Coastal Erosion Hazard Zones Along the Clatsop Plains Oregon: Gearhart to Fort Stevens," prepared by Jonathan Allen and George Priest in 2001 provides the following description of the Clatsop Plains:

The Clatsop Plains are a barrier-beach ridge system that has prograded (advanced) seaward over the past 4000 years. Between 4050 years BP and AD 1700, the coastline is estimated to have accreted an average rate of 0.7 m/yr. (2.3 ft/yr.) (Woxell, 1998). From 1700 (when the last major subduction zone earthquake occurred), to 1885 (Prior to jetty construction), the Clatsop plains accreted at a slightly reduced rate of 0.5 m/yr. (1.6 ft/yr.), with an average rate of 3.3 m/yr. (10.8 ft/yr.) (Woxell). During the last 120 years the Clatsop Plains have continued to prograde seaward, but at rates exceeding several meters per year due to large sand supplies from the Columbia River, and as a result of jetty construction at the mouth of the Columbia River (Gelfenbaum and others 1999). These rates ranged from 2.0 to 5.8 m/yr. (6.6 to 19 ft/yr.), with an average rate of 3.3 m/yr. (10.8 ft/yr.) (Woxell, 1998). Since about the mid-1920s the rate of coastal erosion advance slowed, while erosion has been the dominant shoreline response along the northern end of the Clatsop Plains (i.e. about 6 km (3.7 miles) of Clatsop Spit is presently eroding. The recent phase of erosion may be a function of either: a change in the sedimentation budget of the Columbia River cell, periodic climate shifts (e.g. the Pacific Decadal Oscillation) which cause sediments to be re-distributed along the coast (e.g. 25 years of relatively persistent El Nino conditions since the mid-1790s), or as a result of an increase in the frequency and magnitude of storms in the North Pacific (e.g. Graham and Diaz, 2002) an hence, increased wave energies along the Oregon coast (e.g. Allen and Komar, 2000a 2000b).

The dunes "basic pattern has been towards the development of a smooth arcuate coastline resulting from the large quantities of sand (delivered by the Columbia River) that are distributed in a balanced response to both north-flowing winter currents and the south-flowing summer currents". (Schlicker, 1972). See Figure 1.

During pauses in accretion, submarine sand bars have grown in size to emerge as new beach areas. Beach ridges have developed as sand has piled up immediately inland from

the beach proper by storm wave and by entrapment of blown sand by dune grass. Formed in this way, the beach ridges were left behind as parallel rows of stabilized dunes as the beach migrated seaward.

The beaches and dunes were first inventoried and classified according to their stability in the document, Beaches and Dunes of the Oregon Coast developed by the USDA Soil Conservation Service and the Oregon Coastal Conservation and Development Commission (OCCDC March, 1975). The OCCDC report mapped the dunes into three broad associations: active dunes, recently stabilized dunes, and older stabilized dunes. The extent, distribution and mapping of these dune forms are found in Beaches and Dunes of the Oregon Coast. Interdune areas or deflation plains were included in OCCDC mapping but not as a separate association. They were updated in a subsequent study, Significant Shoreland and Wetland Habitats in the Clatsop Plains by Duncan Thomas.

In the past, Clatsop County has relied upon the following documents for its inventory and classification of beaches and dunes:

1. Beaches - - Beaches and Dunes of the Oregon Coast by USDA Soil Conservation Service and OCCDC, March 1975.
2. Dunes –
  - a. Beaches and Dunes of the Oregon Coast by USDA Soil Conservation Service for Older Stabilized Dune and Recently Stabilized Dune Forms;
  - b. Stability of Coastal Dunes, Clatsop County, Oregon, by Leonard Palmer 1978 for Active Dune forms;
  - c. Significant Shoreland and Wetland Habitats in the Clatsop Plains, by Duncan Thomas for Interdune (or Deflation Plain) Forms; and
  - d. Horning Geosciences Report, by Tom Horning September 22, 1998 (Ordinance 02-05).

These documents formed the basis for the Goal Exceptions that the county adopted in conjunction with establishing the Surf Pines construction setback line (Ordinance 83-17) and the analysis that formed the basis for establishing the Pinehurst construction line by Ordinance 92-90. The Horning Report established the portions of Tax Lot 300, the Charlton property, which were no longer within the active dune area.

Since the publication of the above reports, a new and more detailed report analyzing the characteristics of the Clatsop Plains has been prepared. That report "Coastal Erosion Hazard Zones Along the Clatsop Plains Oregon: Gearhart to Fort Stevens," prepared by Jonathan Allen and George Priest in 2001 is briefly discussed here and is adopted by reference into this document. As described in the executive summary of the report:

" This report describes and documents a range of coastal hazard zones distinguished for the Clatsop Plains. In particular, the report focuses on identifying maximum potential erosion distances for dune-backed shorelines using the geometric model developed by Komar and others (1999). Four hazard zones have been identified for the Clatsop Plains, an active hazard zone high, moderate and low risk zones that respectively depict



decreasing risks of becoming active the next 60-100 years. The landward boundary of the low hazard zone defines the outermost limit of expansion of the active hazard zone associated with a catastrophic event such as a great earthquake on the Cascadia subduction zone, coupled with severe storms.”

The findings and scenarios contained in the report, “Coastal Erosion Hazard Zones Along the Clatsop Plains Oregon: Gearhart to Fort Stevens,” have been used to establish the parameters of the county’s regulations for beach and dune areas on the Clatsop Plains.

Insert Figure 1  
DOMINANT SURFACE AND SUBSURFACE CURRENTS

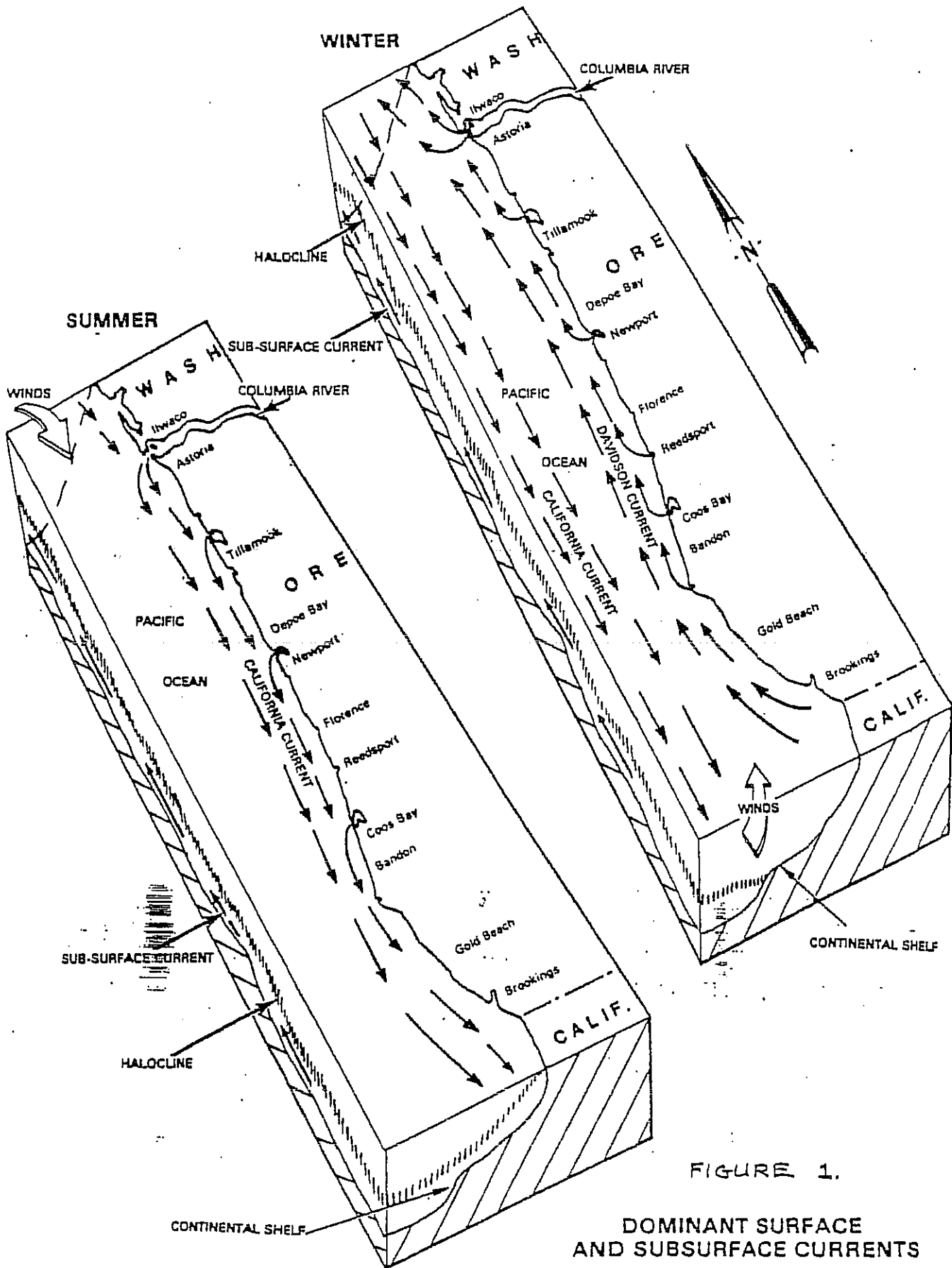


FIGURE 1.

**DOMINANT SURFACE AND SUBSURFACE CURRENTS**

*This Plate was provided through the courtesy of The Portland District, U.S. Army, Corps of Engineers.*

#### 4. Vegetation, Wildlife, Wetlands and Riparian Vegetation<sup>2</sup>

##### Vegetation:

Vegetation in the Clatsop Plains varies extensively in accordance with numerous ecological changes associated with exposure, groundwater level, elevation, and disturbance by man. On the most generalized level, the entire Clatsop Plains areas can be categorized as being in the Sitka Spruce/Western Hemlock zone. However, due to natural and man-caused major changes and the aforementioned ecological variables a relatively small portion of the Clatsop Plains is in climax conifer forest.

Within the Clatsop Plains two types of successional trends can be identified, namely, plant successions on coastal sand dunes and successions on burned and logged areas. Both of these natural successional trends have been altered considerably by the introduction of nonindigenous species and planting programs. Several specialized habitats with unique successional trends also exist on the Clatsop Plains in limited areas. These include forested swamps, wet meadows, bogs, riparian vegetation, and salt marshes.

Community types on the coastal sand dunes can be identified on the basis of environmental conditions, primarily moisture and soil stability. On the dry active dunes indigenous vegetation consists of seashore lupine, yellow sand verbena, sea lyme-grass, red fescue, dune bluegrass, seashore bluegrass, and beach silver-top. Stabilized dry sand dunes with developed soils are characterized by the presence of kinnikinnick, black twin-berry, salal, evergreen huckleberry, western rhododendron, shore pine, and Sitka Spruce.

Inland from the dry foredunes and sandflats and between the ridges of former foredunes are several types of deflation plain communities. Unlike the active sand dunes, the deflation plain environment is not one of sand deposition, but of an abundance of water. Many of the plants in the deflation plains are adapted to grow in wet places. However, the deflation plains are not uniformly wet, but rather there is a gradation from the higher, dry edges to the very wet, marshy bottoms. Also, there are hummocks and small areas of raised ground even in the lowest areas. The plants and plant communities reflect these differences in the elevation of the ground surface in relation to the water table. Frequently as little as six inches vertical height will separate two rather distinct groupings of plants.<sup>3</sup>

<sup>2</sup>For the complete discussion and inventory of vegetation and wildlife (including lists of species found here and rare and endangered species) refer to Biological Inventory of the Clatsop Plains by John Stockham and James R. Pease, 1974, Oregon State University and Significant Shoreland and Wetland Habitats in the Clatsop Plains by Duncan Thomas, 1982.

<sup>3</sup>Description of deflation plain communities modified from Wiedemann, Alfred M., Dennis, La Rae J., Smith, Frank H., Plants of the Oregon Coastal Dunes, O.S.U. Book Stores, Corvallis, 1969.