SIGNIFICANT SHORELAND AND WETLAND HABITATS IN THE CLATSOP PLAINS

A report to CTIC and CREST from Duncan Thomas, identifying wetland, shoreland and riparian values, and describing the significant sites In the Clatsop Plains and the Columbia River Floodplain.

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SIGNIFICANT SHORELANDS AND WILDLIFE HABITAT

This large coastal and estuarine area contains sand dune uplands together with deflation plain and peat bog wetlands. The sand dune uplands still supports some natural and semi-natural* areas, and some of these are significant wildlife habitat under Statewide Planning Goal 17:

1) Foredune grasslands
2) Dune forests

Other types of upland habitat which are likely to be significant in Clatsop County are also outlined here:

3) Old growth forest
4) Dredge-spoil islands in the Columbia River
5) Critical wildlife habitat areas identified by ODFW.

1) Foredune Grasslands

The foredune ridge is widest and lowest at the northern end of the Clatsop Plains, where it is associated with extensive deflation plain wetlands. South of Sunset Beach the dunes become higher, and deflation plains are absent close to the ocean. The foredune grasslands extend from Clatsop Spit to the Necanicum Estuary; they are of variable width in Fort Stevens State Park, and about 500 - 700 ft. wide southwards from it.

The foredunes are of recent origin. The construction of the Columbia jetties at the turn of the century altered the pattern of sand movement along the coast, causing the growth of the sand dunes westwards into the ocean, until the coastline stabilized in its present location. Sand also blew inland, destroying natural vegetation on the older dunes, covering farmland and damaging property (USDA Circular 660, 1942). The foredunes were therefore stabilized during the 1.9301s by the US Department of Agriculture, using introduced beach

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* Semi-natural - an area which has received some human disturbance in the past, but now resembles a natural ecosystem.

grasses. These plantings were successful and the introduced species now behave as native grasses. In addition, a large number of native and introduced dune species colonized the foredunes, forming an extensive semi-natural grassland.

This dune grassland is locally important to wildlife species; in this predominantly forested region, grassland is rare except for lowland pastures. Consequently, the coastal grassland is important to the large numbers of bird and mammal species which feed on the seeds and shoots of grasses and other herbaceous plants, as well as to the predators, particularly birds of prey, which hunt in the grasslands. Migratory birds include flocks of snow buntings, Lapland longspurs and various sparrows. Raptors, which use the area regularly or occasionally, include marsh hawks, short-eared owls, snowy owls, red-tailed hawks, American kestrals, rough-legged hawks, peregrine falcons and probably other species. The dune grassland is extensively used by black-tailed deer.

Suitable uses of the foredunes are recreational: a limited number of access roads to the ocean beaches with parking lots and facilities, are appropriate; bike trails and footpaths are also suitable. Destruction of the grassland by heavy off-road vehicle use should be prevented, since this will lead to destruction of the grassland by moving sand and the loss of its resource value.

2) Dune Forests

The second dune ridge which is older than the foredunes, but whose vegetation was destroyed when the system became mobile, was planted with coastal pine (Pinus contorts var. contorta) and now supports an even-aged stand of this species. This community supports birds and mammals typical of coniferous forest in the area. The wildlife value of the coastal pine forest will increase as the trees mature, but is currently not very high. Good examples of this community occur in Fort Stevens State Park and in several localities south to Gearhart,

but have not been mapped as significant for this study.

Further inland the dunes may support forests of Sitka spruce and hemlock, often with a dense understory of berry-bearing shrubs such as salal, evergreen huckleberry and salmonberry. This is the climax vegetation of sand dunes on Gearhart fine sandy loam, and is therefore of scientific interest as a component of the dune ecosystem. It also supports populations of black-tailed deer and other mammals and birds. The best examples of this spruce/hemlock dune forest are in Fort Stevens State Park (in Warrenton and Clatsop County). In addition, there are a few other examples in Warrenton which have been mapped as significant. In all cases where significant spruce/hemlock forest has been identified, it is associated with coastal lakes and deflation plain wetlands, and consequently forms sand dune natural resource areas with high habitat diversity.

Recreational uses, including footpaths and bike trails are consistent with the protection of these uplands.

3) Old Growth Forest

Elsewhere in Clatsop County, examples of significant upland areas are natural ecosystems, particularly old growth forest. This habitat type has been so heavily impacted that insufficient acreage remains to supply the needs of natural resource protection. Thus, the remaining old growth forest in the County has exceptionally high resource value and should be protected. An investigation is needed to establish criteria for the protection of areas of mature forest to insure that some of these will eventually proceed to old growth. This might at least bring the resource up to a minimum level. Suitable actions would be the preservation of riparian corridors along rivers, scenic forest corridors along roads, and areas of potentially spectacular scenery, such as mountainsides along the coast and river canyons. Low intensity recreation is about the only use compatible with the protection of old-growth forest.

4) Dredge-spoil Islands in the Columbia River

Another habitat of significance to wildlife is dredge-spoil islands in the Columbia River. Because of their remoteness from human disturbance and protection from some predators, these are important bird nesting areas for gulls and Caspian terns and are also extensively used by fur-bearing mammals. Protection of these values is compatible with a number of other uses, such as dredge material disposal outside the nesting season.

5) **Critical Wildlife Habitat Areas Identified by ODFW**

The Oregon Department of Fish and Wildlife has defined the following areas of critical wildlife habitat in their report, "Fish and Wildlife Habitat Protection Plan for Clatsop County" (1976). These areas should be protected.

Critical habitat for Roosevelt Elk

Critical habitat for Columbia White-tailed Deer

Critical areas for the nesting of birds, particularly:

- Snowy Plover (nests on young dunes)
- Great Blue Heron (nests in colonies in mature trees)
- Cliff and Island-nesting seabirds
- Birds of prey, particularly Bald Eagle (and Osprey) nests

RIPARIAN VEGETATION

In Oregon, riparian vegetation is described in the Statewide Planning Goals as being an attribute of the shore adjacent to aquatic areas. A definition of riparian vegetation is therefore difficult, since it is dependent upon the characteristics of the aquatic area. The following seven sections fully describe the functional and spatial relationships between riparian vegetation and aquatic areas, and can be used for field identification. Where vegetation which meets these criteria is present,

it should be protected. The major tracts of riparian vegetation in the Clatsop Plains and Columbia River Estuary were mapped during this project.

Riparian vegetation is a difficult concept and is therefore discussed in some detail in seven sections below. These are:

i) Riparian vegetation types
2) Width and location of riparian zones
3) Functions of riparian vegetation
4) Definitions of "shoreline"
5) The extent of riparian vegetation (1) within riparian zones (2)
6) Non-riparian vegetation within riparian zones
7) Riparian zones around significant wetlands

1) Riparian Vegetation Types

a) Trees and shrubs growing on upland adjacent to an aquatic area.
b) Trees and shrubs (taller than 12 ft.) growing in wetland (Sect. 7).
c) Non-significant emergent marsh or low shrub wetland, except where this is managed for agricultural use.

2) Width and Location of Riparian Zones

a) In a zone up to 50 feet wide from the shorelines of:
- lakes of surface area exceeding 1 acre.
- estuaries up to the heads of tide.
- larger creeks and rivers (average annual flow exceeding 100 cu. ft/sec.)
- areas of significant wetland habitat, except where the wetland vegetation is trees and shrubs exceeding 12 ft. in height (Sect. 7).

b) In a zone up to 30 feet wide from the shorelines of:
- smaller creeks (average annual flow less than 100 cu.ft/sec.)
- diked sloughs of width exceeding 15 ft. for some of their length.

3) Functions of Riparian Vegetation

a) It maintains water temperature and quality and enhances fish habitats.

b) It provides bank stabilization.

c) It provides habitats for the breeding, feeding and resting of both aquatic and upland wildlife species.

d) It protects aquatic ecosystems from unnecessary human disturbance.

4) Definitions of "Shoreline"

a) On estuaries, the line of non-aquatic (upland) vegetation, or mean higher high water where vegetation is absent.

b) Ordinary high water on lakes, rivers and other bodies of non-tidal water.

c) On significant wetland areas the shoreline is defined here as the boundary of the significant area.

5) The Extent of Riparian Vegetation (1) Within Riparian Zones (2)

Within the riparian zones defined in section 2, riparian vegetation defined in section 1 may extend for all or for only a part of the maximum zone width from the shoreline. Riparian vegetation ends at either:

a) The landward boundary of the zone defined in section 2, or

b) Within the zone riparian vegetation may end at the boundary with non-riparian vegetation defined in section 6.

6) Non-riparian Vegetation Within Riparian Zones

Riparian vegetation is not agricultural crops, land managed as pasture, horticultural or landscaped areas, or unvegetated areas.

7) Riparian Zones Around Significant Wetlands

Wetland areas dominated by woody plants exceeding 12 feet in height fulfill the riparian functions described in section 3. Around an area of significant wetland, the riparian vegetation may be composed entirely or partially of forested wetland (Figure 3).

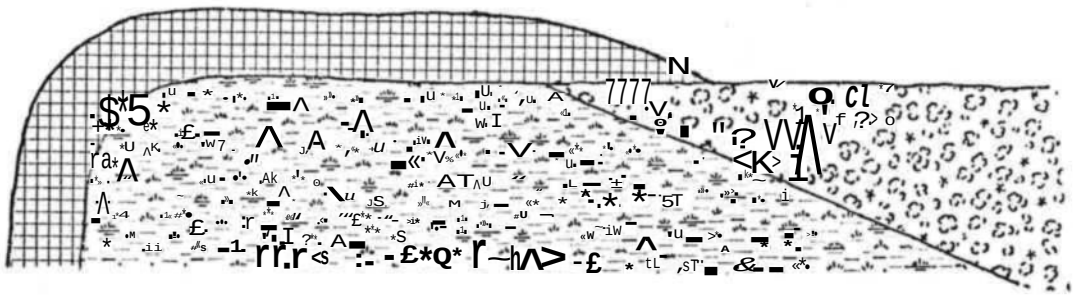
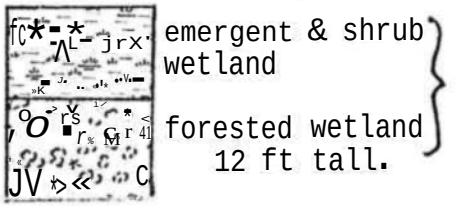


Figure 1. The location of a 50 ft wide riparian zone around a significant wetland area dominated partly by emergent vegetation and partly by woody vegetation exceeding 12 ft in height.



emergent & shrub wetland

forested wetland 12 ft tall.

significant wetland

riparian vegetation

WETLANDS DESCRIPTION

i) WETLAND TYPES

In the Clatsop Plains, three kinds of wetlands were identified, each characterized by different hydrology. These are:

1) Young Deflation Plains
2) Older Deflation Plains
3) Peat Bogs
4) Columbia Floodplain and Necanicum Floodplain

1) Young deflation plains are found near the ocean in recently accreted areas. They are characterized by species: poor marsh or swamp vegetation on immature, sandy soils. The water-table fluctuates so that wetlands are flooded during wet times of year, and the soil surface is moist or even dry at other times. The ratio of standing water to other types of wetland is relatively low. These wetlands have rather low natural resource value, but their significance is enhanced on account of their great extent and because they are part of a fine, natural sand dune system with great habitat diversity.

2) Older deflation plains generally occur in the middle of the Plains, between foredunes with young deflation plains and the peat bogs. They are generally long (north-south axis) and narrow in shape, and contain coastal lakes with marshes, swamps and riparian vegetation. The ratio of open water to other wetlands is relatively high. The high natural resource values and the high habitat diversity of these areas makes them the most important of the wetland areas. These lakes depend upon the ground-water in the dune system. They are characterized by small drainage areas and often lack inflow and outflow channels. They are hydrologically dependent upon the movement of water through the course sand of the dune system, probably have slow turn-over rates, and are very susceptible to water pollution. The marshes and swamps may be flooded permanently or seasonally, but the surface soil - usually with high organic content - is permanently saturated.

3) Bogs occur in deflation plains or lagoons which have filled in with organic material. They are generally broad and occur furthest from the ocean, adjacent to Clatsop Ridge. Lakes are a less prominent feature than in old deflation plains, but some important ones are present. The gradual in-filling of lagoons and deflation plains by peat raises the surface relative to the water table, so that many areas of bog are seldom flooded, but remain saturated and poorly drained at all times due to the water-retaining properties of the soil. These wetlands have moderate natural values overall, but values may be high locally. Bogs occur in Hammond and Warrenton, along the Skipanon River, and from Cullaby Lake south to Stanley Lake. In the past, most bogs were drained for agricultural use, but some of these have subsequently reverted to a natural condition.

4) The Columbia River Estuary floodplain was formerly tidal marshes and swamps and is now diked. Significant wetlands in this area are likely to be substantially altered from their original condition. Natural resource areas which have been identified include tide-gated sloughs and areas of marsh and swamp. In most instances, the restoration of these wetlands to the estuary would be appropriate management. They

have moderate fish and wildlife value, and form a system of non-tidal wetlands associated with the estuary, thereby increasing the area's habitat diversity.

The Necanicum River and estuary are located at the southern end of the Clatsop Plains, and the course sandscent peats of the dune system changes to riverine silts and gravels. As a result, small creeks, oxbows and ponds become more important features in Necanicum flood-plain marshes, which have moderate to high wildlife value.

RIVERINE HABITAT. Although the Clatop Plains have extensive wetlands, these are not linked to important river systems, with the notable exception of the Necanicum River. Generally, drainage channels through the Clatsop Plains marshes are maintained by man, and where they are not maintained, become blocked by vegetation and by beavers. Riverine wetland and riparian habitat is therefore of very limited distribution and importance.

ii WETLAND MANAGEMENT

The wetlands can be divided into open water areas and marshes/swamps for a discussion of management.

With open water areas, the main problem is likely to be eutrophication by septic tank leachate and fertilizer. At present, many lakes have a very dense growth of water-weed and algal blooms. If the eutrophication trend continues, areas with a high water residency time are likely to become oxygen-depleted and lose their fish and wildlife values. Naturally, these lakes tend to be oligotrophic, lacking dense, floating vegetation and algal blooms. Shoreline development may impact natural values around some of the larger lakes. Typical impacts are the destruction of riparian vegetation, and the proliferation of single-purpose docks. These should be avoided where possible and riparian restoration should be carried out where feasible.

The major causes of loss of natural values to marsh and swamp areas come from draining, filling and logging. These habitats are more susceptible to a variety of human disturbance than open water, because of the delicate nature of their surfaces, and the relative ease with which they can be filled. In general, marshes and swamps can only support a minimum of human activities, such as low-intensity recreation. Also, a limited number of structures on piling, such as footpaths or access ways to adjacent lakes are not incompatible with natural resource protection. Marsh areas in particular need a buffer zone of riparian vegetation on the shoreward side to protect them from excessive disturbance.

iii SIGNIFICANT WETLANDS

For wetland classification, the USFWS system of Cowardin et al (1979) was followed. At the start of this project, all the possible wetland areas were delineated using aerial photographs, contour maps and soils maps. These areas were then visited to determine whether significant wetlands were present.

Significance of wetlands sites was a cumulative assessment of many features, the main ones being:

- Size: larger areas are more significant than smaller ones.
- Naturalness: the more natural or pristine, the greater the significance of a wetland.
- Habitat diversity: the presence of a diverse assemblage of natural wetland (and upland) habitats increases significance.
- Wetness: the significance of wetland areas is increased by the presence of permanent standing water.
- Habitat for rare or endangered species, critical habitat for game or non-game wildlife species increases significance.
- Heavy human disturbance of a wetland decreases its significance.
- Close proximity to dense housing development or industrial areas decreases significance.

The wetland areas were described in terms of plant communities, characteristic of different soils and hydrological regimes. These are listed in the following section.

These same criteria were also applied to wetlands in the Columbia River Floodplain. In this case, an additional criterion was the contribution made by the wetlands to the tidal ecosystem of the Estuary and the River.

iv WETLAND VALUES

Wetlands have been identified at both federal and state levels as being important fish and wildlife habitat. Nutrients from the groundwater and carbon dioxide are used by marsh plants to give levels of primary productivity which are often very high. This productivity is utilized by herbivores and detritovores, and eventually supports a wide range of important fish and wildlife species. Each wetland area is unique in the combination of values present, but for the Clatsop Plains area, the following species were identified as being common in the coastal lakes and other wetlands:

Overwintering and Breeding (*) Waterfowl

American widgeon	Green-winged teal
Bufflehead	Ring-necked duck
Mallard (*)	Common merganser
Wood Duck (*)	
Hooded Merganser (*)	

Other Breeding Birds

American bittern	Pied-billed grebe
Sora rail	Song sparrows
Virginia rail	Red-winged blackbird
Green heron	Yellowthroat
Coot	Marsh hawks
And many other species.	

Pelagic birds which use the wetlands in winter: common loon, western grebe, cormorant species.

Warm water fish which may be taken as game species:

White crappie	Warmouth
Black crappie	Largemouth bass
Brown bullhead	Catfish
Yellow perch	Cutthroat trout (often stocked)
Bluegill	Rainbow trout (stocked)
Sunfish	

Medium and large mammals:

Nutria	Black-tailed deer
Beaver	Roosevelt elk
Muskrat	
Raccoon	

PLANT COMMUNITIES IN THE CLATSOP PLAINS

1A Open water with Lew floating or submerged aquatic vascular plants.

IB Water which usually becomes more or less filled with floating or submerged aquatic vascular plants during the summer and fall. Plant species include:

- Callitriche species (water starwort)
- Lemna minor (duckweed)
- Ceratophyllum demersum (water hornwort)
- Elodea densa (South American waterweed)
- Elodea nuttallii (Nuttaill's waterweed)
- Myriophyllum brasiliense (South American water-milfoil)
- Nyxnphaea odorata (fragrant waterlily)

2 Shallow but more or less permanent water which becomes covered by a dense growth of non-persistant emergent and floating-leaved plants. The main dominants are the yellow flowered Indian Pondlily and the

marsh cinquefoil, A species list of plants common or dominant in this community includes:

Potomogeton species (pondweed)
Nuphar polysepalum (indian pondlily)
Hippuris vulgaris (common mare's tail)
Potentilly Palustris (marsh cinquefoil)
Utricularia vulgaris (common bladderwort)

3 In shallow water where lakes are filling in with aquatic vegetation, a community dominated by sedge tussocks floating in liquid mud. Between the usually compact tussocks, non-persistant emergent and floating leaved plants typical of #2 are often found. Common or dominant species include:

Carex cusickii (Sucick's sedge)
Carex vesicaria (inflated sedge)
Carex interior (inland sedge)
Menyanthes trifoliata (bogbean)
Nuphar polysepalum (indian pondlily)
Potentilly palustris (marsh cinquefoil)

4 Sedge meadows dominated by tussocks of Sitka sedge, This vegetation is flooded by two or three feet of water during wet periods though the sedge tussocks are usually persistently emergent, During dry periods, the surface between the tussocks may be exposed or shallowly flooded. This community is typical of wet emergent marshes on Brallier peat, and it usually contains floristic elements of either wetter (2, 3) and/or drier (5, 11A) communities, Common plant species include:

Carex sitchensis (Sitka sedge)
Carex cusickii (Cusick's sedge)
Carex obnupta (slough sedge)
Nuphar polysepalum (indian pondlily)
Spiraea douglasii (spiraea or hackberry)
Penanthe sarmentosa (water parsley)

5 Sedge meadows dominated slough sedge, saturated or flooded at all times. This vegetation is flooded by a foot or more of water during wet periods, and the saturated soil surface is exposed during dry conditions. It occurs on Brallier muck and also on Warrenton loamy fine sand. Common species include:

Carex obnupta (slough sedge)
Lysichiton americanum (skunk cabbage)
Oenanthe sarmentosa (water parsley)
Athyrium filix-femina (lady fern)
Spiraea douglasii (spiraea, or hackberry)
Lonicera involucrata (twinberry)
Carex sitchensis (Sitka sedge)

6 Slough sedge wetland on young deflation plains. These wetlands, on sandy soil close to the ocean, have a fluctuating water table and are flooded during wet periods but dry out so that the soil is moist, not saturated, during dry conditions. Common or dominant species include:

Carex obnupta (slough sedge)
Potentilla pacifica (pacific silverweed)
Deschampsia cespitosa (tufted hair-grass)

A number of unusual or interesting plant species occur in this community:

Botrychium multifidum (leathery grape-fern)
Habenaria greenei (Green's bog-orchid)

7 Shrub-dominated wetland on young deflation plans, As with vegetation type #6, this type is saturated or flooded during wet periods and may be merely moist at other times. The usual dominant species is Salix hookeriana (Hooker willow), with an herb layer of Carex obnupta (slough sedge).

8 Shrub-dominated swamps. This vegetation type resembles #7, but occurs on more mature soils, particularly Brallier muck and also Warrenton loamy fine sand. Soils are less well draining than #7,

and are saturated or flooded at all times. Species typical of this community are:

Salix hookeriana (Hooker willow)
Salix lasiandra (Pacific willow)
Pyrus fusca (crabapple)
Lysichiton americanum (skunk cabbage)
Carex obnupta (slough sedge)

In addition, scattered trees of Picea sitchensis (Sitka spruce) and Alnus rubra (red alder) may be present.

9 Sitka spruce swamp. Forested swamp dominated by Sitka spruce trees, which may become large (they are generally stunted in type 8). Soil conditions are saturated with occasional flooding. The understory is dominated by skunk cabbage and slough sedge, with Rubus spectabilis (salmonberry), and Sambucus racemosa (elderberry) in areas which are transitional between wetland and upland.

10 Alder swamp. Forested swamp dominated by red alder with an understory of slough sedge and skunk cabbage. Soil conditions are saturated. Red alder is mainly an upland species and appears to be intolerant of very wet conditions. Well developed alder swamps are not common.

11 Low shrub vegetation, in which spiraea or hackberry (Spiraea douglasii) is the main dominant. A wet and a drier variant of this type have been identified. The wet variant often occurs on Brallier muck and is flooded for most of the year. Typical associates of the spiraea are slough sedge and Sitka sedge (Carex sitchensis). The drier variant is also found on Brallier peat, often on abandoned cranberry bogs, where it grows with other shrubs such as sweet gale (Myrica gale) and labrador tea (Ledum glandulosum).

12 Sphagnum bog. The bog surface is covered by a mat of bryophytes, principally of the genus Sphagnum. Soil conditions are saturated, on account of the water-retaining properties of the moss, and the

community develops on Brallier peat. Common vascular plants include species of herb and shrub such as:

Carex obnupta (slough sedge)
Carex sitchensis (Sitka sedge)
Carex cusickii (Cusick's sedge)
Lysichiton americanum (skunk cabbage)
Trientalis arctica (northern starflower)
Drosera rotundifolia (sundew)
Eriphorum chamissonis (cotton-grass)
Ledum glandulosum (Labrador tea)
Kalmia occidentalis (swamp laurel)
Gaultheria shallon (salal)

13 Disturbed marsh flora (wet variant). The usual reason for such disturbance is the logging of adjacent forested areas. Following the destruction of marsh vegetation types such as #4 and #5, these areas become dominated by species such as:

Sparganium emersum (bur-reed)
Juncus nevadensis (Sierra rush)
Juncus species (rush)
Glyceria species (manna grass)

14 Disturbed marsh flora (dry variant). This vegetation develops on the site of former forested swamp after it has been logged. Common species are:

Juncus effusus (common rush)
Carex obnupta (slough sedge)
Oenanthe sarmentosa (water parsley
Juncus ensifolius (dagger-leaved rush)
Carex canescens (gray sedge)

In addition to the wetland plant communities described above, marsh and swamp areas, particularly those characteristic of drier hydrological regimes such as 6, 7, 8, 9, and 10, are sometimes mixed with patches of upland vegetation. These upland communities are described in sections 15 - 17 below.

15 The forest communities which develop on well-drained sandy soils, particularly the old sand-dunes which surround the Clatsop Plains wetlands, are typically dominated by the following species:

Trees: Alnus rubra (red alder)
Picea sitchensis (Sitka spruce)
Tsuga heterophylla (hemlock)
Rhamnus purshiana (cascara)

Shrubs: Sambucus racemosa (red elderberry)
Rubus spectabilis (salmonberry)
Vaccinium ovatum (evergreen huckleberry)
Vaccinium parvifolium (red huckleberry)
Gaultheria shallon (salal)

Herbs: Maianthemum californicum (false lily-of-the-valley)
Polystichum muniturn (sword fern)

16 Younger sand-dunes often support planted coastal pine forest, and this may occasionally be mixed with wetland types 6 and 7.

REFERENCES

1) CREST, 1979: Columbia River Estuary Regional Management Plan; Columbia River Estuary Study Taskforce, Astoria, OR.
2) Maine, N., 1979: Necanicum Estuary Inventory; Report to Clatsop County.
3) Nature Conservancy, 1977: Oregon Natural Areas - Data Summary.
4) Sanderson, R. B., Shulters, M. V., Curtiss, D. A., 1973: Lakes of Oregon, Volume 1, a report by U.S.G.S.
5) Taylor, D., Knispel, W., 1976: Fish and Wildlife Habitat Protection Plan for Clatsop County. ODFW report to Clatsop County.

THE MAPS

The 1" to 400′ base map was aerial photos from the Corps of Engineers (black and white - 1973), prepared for a sewer feasibility study by CH2M Hill. For the field work, these were supplemented by more recent (1981) Corps of Engineers infra-red aerials. In areas not covered by these aerials, USGS quad sheets and CREST base maps (scale 1" to 2,0001) were used.

Overlays were produced at a scale of 1" to 400' in transparent acetate for the aerial photographs, or on other base maps when aerials were not available. The following symbols were used:

Blue hatching - - - Significant wetland, Goal 17
Brown or brown/blue hatching - - - Significant wetland, Goal 5
Green hatching - - - Significant wildlife and shoreland habitat.
_____ - - - Major riparian vegetation.

A LIST OF THE SIGNIFICANT SITES

Warrenton Sites

W 1	1st Deflation Plain
W 2	State Park Wetlands
W 3	Coffenbury Lake
W 4	Leinenweber Lake
W 5	Abbot Lake Wetlands
W 6	Crabapple/Creep and Crawl Lakes
W 7	Long Lake
W 8	Pond Lily Lake
W 9	Wild Ace Lake
W 10	Shag Lake/Warrenton Bog
W 11	Clear Lake
W 12	Cemetery Lake
W 13	Warrenton Sloughs
W 14	Middle Skipanon
W 15	Upper Skipanon
W 16	Old Skipanon Creek

Hammond Sites

H 1 West of Russell Drive
H 2 Hammond Bog
H 3 West of Lake Drive
H 4 West of Mooring Basin

Gearhart Sites

G 1 Neacoxie Creek
G 2 Deflation Plain
G 3 Gearhart Bog, part of CP 16
G 4 Mill Creek, part of CP 19

Seaside Sites

S 1 Circle Creek Wetlands
S 2 Neawanna Swamp, part of CP 20
S 3 Stanley Lake
S 4 Necanicum River

Clatsop Plains Sites

CP 1 Clatsop Spit
CP 2 Swash Lake Area
CP 3 Foredunes
CP 4 1st Deflations Plain
CP 5 Slusher Lake, etc.
CP 6 ? Lake
CP 7 Smith Lake
CP 8 Skipanon Swamps
CP 9 Skipanon Bog
CP 10 Golf Course Lake
CP 11 Sunset Lake
CP 12 West Lake
CP 13 Taylor Lake
CP 14 Cullaby Lake
CP 15 Cullaby Bog
CP 16 Gearhart Bog
CP 17 Upper Neacoxie
CP 18 Triangle Lake
CP 19 Mill Creek
CP 20 Neawanna Swamp

Other Clatsop County Sites

LY 22 Sloughs
LY 23 Wetlands/Wildlife
EC 26 Islands
EC 27 Tongue Point
EC 28 John Day

EC 29 John Day - Knappa Dock, Riparian Vegetation
EC 30 Brownsmead
EC 31 Aldrich Point - Eastwards, Riparian Vegetation
EC 34 Tenasilliahe Island
EC 35 Driscoll Slough Marshes

W - Warrenton
H - Hammond
G - Gearhart
S - Seaside
CP - Clatsop Plains
LY - Lewis & Clark & Youngs River
EC - Eastern Clatsop

Appendix - Shoreline Changes, Goal 16 areas.

W 18 Middle Skipanon Shoreline Change
LY 24 Tidal Marshes on the Lewis & Clark River
EC 32 Tidal Marshes at Aldrich Point
EC 33 Hunts Creek Tidal Swamps at Bradwood

STTE nESP?IDTTnMS - TORRENTON

Warrenton - Site //1 - Goal 17

(Overlay - 1" to 400', #1s 3, 5, and 8)

Location - Coastal, with 3,000 feet of shoreline in FSSP.

Size - c. 500 acres.

Vegetation Types - 6 and 7, together with some upland vegetation (Types 16 and 17).

Riparian Vegetation - None.

Soil - 8A (dune land).

Site Description - A very large area of deflation plain. Wetlands, the dune ecosystem adjacent to the coast in Warrenton (and throughout Clatsop Plains) is of recent origin, having been formed in intertidal and shallow subtidal areas following alterations to the pattern of sand movement along the coast after the construction of the Columbia River South Jetty. The area was stabilized by the U.S. Soil Conservation Service, who planted introduced European beach grass and native trees and shrubs on the unvegetated young dunes. The deflation plain

vegetation is largely natural, and is probably still in a successful stage; that is, it is evolving toward different kinds of wetland vegetation in the course of natural ecosystem development, These deflation plains (elevation c. 18-20 feet) are wet or flooded in winter and spring and dry out during the summer, The topsoil (sand) may be dry during the late summer.

Values - Fisheries - none. Wildlife - low to medium. Wildlife usage: birds, breeding, feeding numerous small birds use the shrub vegetation, birds of prey hunt over the dunes and deflation plains, especially marsh hawks. Includes Nature Conservancy Site for Clatsop County it6 and 60 (in part). The main value of this area is as part of a large coastal ecosystem, Preservation of these values are consistant with use of the area for recreation, provided the vegetation cover is not destroyed.

Management - The site should be managed to preserve its natural values as part of a young sand dune ecosystem.

WARRENTON - Site it2 - Goal 17

(Overlay - 1" to 400', it3)

Location - FSSP, south and east of Battery Russell.

Size - 65 acres.

Vegetation Types - 4 and 8

Riparian Vegetation - none

Soils - 15A (freshwater marsh)

Site Description - Part of a system of deflation plain wetlands, dominated by willows, and by sedges, and which extends into Clatsop County and Hammond. The southern part of the site has some disturbance, since it was formerly used as a sewage disposal area for the State Park Campsite. The site is seasonally flooded and the soils remain saturated during the summer, with small areas of semi-permanent standing water.

Values - Fisheries - none. Wildlife - some use of wetland habitat by birds and mammals. Included in Nature Conservancy Site 60. This wetland is part of the large complex of dunes, deflation plains and other marshes which occupy the western half of the City of Warrenton.

Management - The site should be managed to preserve its natural values.

WARRENTON - Site #3 - Goal 17

(Overlay - 1" to 400', #5)

Location - Coffenbury Lake, FSSP

Size - 70 acres

Vegetation Types - 1A, IB and 2

Riparian Vegetation - Well developed, c. 10,000 feet x 50 feet wide.

Soils - Lake sediments.

Site Description - A long, narrow coastal lake between high forested sand dunes. Small drainage basin, inflow and outflow, probably as seepage through the sand dunes.

Values - Fisheries - recreational, stocked with cut-throat and rainbow trout. Wildlife - some waterfowl value, breeding and overwintering of ducks and geese. Part of Nature Conservancy Site 60.

Management - Should be consistent with maintaining its high recreational value and should preserve open water for swimming, fishing and boating. Riparian vegetation should be protected except to provide access for water-dependent activities and the small areas of marsh and swamp, mostly at the southern end, should be preserved.

WARRENTON - Site #4 - Goal 17

(Overlay - 1" to 400', #8)

Location - This wetland site is a southerly extension of Coffenbury Lake from which it is separated by an unsurfaced road built on fill. Southwards the site extends to the City limits at DeLaura Beach Road and includes the shallow Leinenweber Lake and also Kyle Lake.

Size - About 50 acres.

Vegetation Types - IB, 7, 9.

Riparian Vegetation - About 1,000 feet x 50 feet, situated on the west side of Leinenweber Lake.

Soils - Lake sediments, 8A (dune soils), 15A (freshwater marsh), 24E (Westport fine sand).

Site Description - A southward continuation of the Coffenbury Lake deflation plain in which the water becomes much shallower with extensive patches of hooker willow dominated swamp, and also forested swamp at the southern end. The area is probably permanently flooded.

Values - Fisheries - some sport fishing of warm water fish in the shallow lakes. Wildlife - high waterfowl and non-game bird value, suitable habitat for the breeding of ducks and green herons.

Management - The site should be managed to maintain the natural wetland values for fish and birds described above. The riparian vegetation should be preserved.

WARRENTON - Site #5 - Goal 17

(Overlay - 1" to 400', #5)

Location - Mostly in Fort Steven's State Park, west of Ridge Road, between camping area entrance and Camp Kiwanilong entrance.

Size - About 100 acres.

Vegetation Types - IB, 2, 3, 4, 8, 9, 10

Riparian Vegetation - None

Soils - 15A (freshwater marsh) and lake sediments.

Site Description - A large inaccessible wetland site surrounded by forested dunes. A number of small lakes are present, of which Abbott Lake is the largest (the adjacent Creep and Crawl Lake is described under Site #6). These are in the process of filling in with vegetation and are variously dominated by floating and floating-leaved aquatic plants, and by very wet sedge vegetation. These small lakes make up only a small portion of the 100-acre site; the remainder is occupied by extensive forested swamps surrounding these lakes, and dominated by mainly Sitka Spruce and by alder and willows. The small lakes are permanently flooded, while the surrounding swamps have mostly saturated soils, and may flood occasionally.

Values - Fisheries - little sports fishing occurs at present because of inaccessibility, though populations of warm water game fish are present. Wildlife - lakes are important undisturbed wetland ecosystems, supporting a range of natural wetland values including fishes, water birds and mammals. In addition, the forested swamps have many of the values of coastal spruce forest ecosystems. Included in Nature Conservancy Site #60.

Management - Site #5 should be managed to preserve the numerous natural values described above.

WARRENTON - Site it6 - Goal 17

(Overlay - 1" to 4001, it5 and it8)

Location - In the SE part of Fort Stevens State Park, and extending southwards beyond the Park boundary. This site includes Crabapple and Creep and Crawl Lakes (Note: these lakes are incorrectly named on the 7V quad sheet).

Size - About 80 acres.

Vegetation Types - 1A, IB, 2, 4, 8

Riparian Vegetation - c. 16,000 feet x 50 feet wide along Crabapple and Creep and Crawl Lakes.

Soils - Lake sediments.

Site Description - Two shallow lakes, formed in old deflation plains and separated by a narrow low dune ridge. Crabapple Lake is broad, with marshy swampy islands, and supports a lush growth of water plants in the summer. Creep and Crawl Lake is narrow, deeper, has less marsh, and many snags. Both are hydrologically dependent on the water table in the sand dune system, and have no obvious inflow or outflow channels.

Values - These coastal lakes have value for recreational fishing. Access is by small boat ramps in the State Park. Part of Nature Conservancy Site it60. They are also important waterfowl breeding habitat.

Management - This site should be managed for low intensity recreation and to maintain the wetland values described above. Riparian vegetation should be preserved.

WARRENTON - Site it7 - Goal 17

(Overlay - 1" to 400', it8)

Location - Long Lake in Camp Kiwanilong, west of Ridge Road between the Camp entrance and DeLaura Beach Road.

Size - 17 acres (Lake - 12 acres).

Vegetation Types - 1A

Riparian Vegetation - 7,000 x 50 feet wide on both sides of the lake.

Soils - Lake sediment.

Site Description - A long narrow, relatively deep lake between high dune ridges. No wetlands apart from the lake area; riparian vegetation is forest or scrub. Hydrologically dependent on the water table in the sand dune system with no inflow or outflow channels.

Values - Fish, waterfowl, recreational.

Management - The lake should be managed for water-dependent recreation and educational usage, including swimming, boating, fishing and wildlife observation. Riparian vegetation should be maintained except where access is needed for water-dependent recreation or other water-dependent use.

WARRENTON - Site #8 - Goal 17

(Overlay - 1" to 400', #8)

Location - Pond Lily Lake, west of Long Lake (see W. Site #8) and north of DeLaura Beach Road, in Camp Kiwanilong.

Size - About 30 acres.

Vegetation Types - IB, 2, 3, 4, 12.

Riparian Vegetation - About 7,000 feet x 50 feet on east and west shores, mostly Sitka Spruce forest.

Soils - Lake sediments.

Site Description - A fine example of a shallow coastal lake in a former deflation plain, filling in with wetland vegetation. All the wettest vegetation types are well represented, together with a young Sphagnum bog. The forested dune shore to the west of Pond Lily Lake is a fine example of an old dune stabilized by coastal spruce forest and could be managed as significant shoreland habitat.

Values - Fisheries - some warm water game fish, but the lake is mostly too shallow for fishing. Habitat for waterfowl and non-game bird species and aquatic furbearing mammals. High educational values.

Management - This site should be managed to maintain the high natural values described above. The wetland ecosystem and the associated riparian vegetation should be preserved.

WARRENTON - Site #9 - Goal 17

(Overlay - 1" to 400', #18)

Location - Wild Ace Lake, west of Ridge Road and north of DeLaura Beach Road.

Size - Approximately 34 acres.

Vegetation Types - LA, 2, 9, 11

Riparian Vegetation - c. 3,600 x 50 feet, mostly along the lake shore.

Soils - Lake sediments.

Site Description - A compact wetland site, connected to Cemetery Lake by a culvert under the road fill. The shallow lake is surrounded by expensive marshes which are more or less permanently inundated. The area is very marshy and inaccessible, except by canoe.

Values - Some fish, probably underexploited through lack of access and shallow water. Wildlife values high - waterfowl and aquatic furbearers. High value as a natural wetland ecosystem. Nature Conservancy Site #14.

Management - This site should be managed to preserve its natural values, protecting the wetlands and riparian vegetation.

WARRENTON - Site #10 - Goal 17

(Overlay - 1″ to 400′, #2, 4, 5, 8)

Location - East of Ridge Road between Hammond and the County Road which passes the Sanitary Landfill.

Size - Approximately 400 acres.

Vegetation Types - 1A, IB, 2, 3, 4, 5, 8, 9, 10, 11, 13, 14.

Riparian Vegetation - c. 4,500 x 50 feet around Shag Lake and associated emergent wetlands.

Soils - Lake sediment and Brallier muck.

Site Description - A large and very diverse wetland system. These broad deflation plain wetlands are bounded to the east by the easternmost sand dunes and where the dunes are discontinuous, merge with the Columbia River Foodplain. To the north, this wetland system continues into Hammond (see H 2). The southern half of the site is the wettest, with extensive tracts of flooded sedge marsh and low Spiraea shrub, and including a small coastal lake, Shag Lake. The northern half of the site is covered with willow and forested wetlands. This area was formerly agricultural land, reportedly used for growing peas on the drained Brallier muck. It was later abandoned and the failure of the drainage system (due in part to beaver activity), has caused a reversion to wetland vegetation indistinguishable from the region's natural plant communities. In recent times, there has been some disturbance

through logging of the surrounding dune ridges and the forested swamps, but the area maintains a high overall natural wetland value.

Values - Some fishing in Shag Lake, which is reportedly stocked with cut-throat trout. Wetlands have high value as habitat for birds and mammals, and as natural and diverse wetland habitats. Nature Conservancy lists part of this site as Clatsop County #13 (the Shag Lake area).

Management - This area should be managed to protect its considerable natural values as wetland habitat. Suitable uses include hunting, fishing and wildlife observation.

WARRENTON - Site #11 - Goal 17

(Overlay - 1" to 400', #5)

Location - West of S. W. Juniper Avenue: Clear Lake

Size - About 25 acres.

Vegetation Types - 1A, 2, 4, 9, 11.

Riparian Vegetation - c. 5,000 x 50 feet around the lake and emergent wetlands.

Soils - Lake sediments.

Site Description - A small, relatively deep coastal lake, situated in a depression surrounded by high sand dunes which isolate it from site #10 to the west and from the Skipanon Creek/Columbia River Floodplain to the east. The lake has steep shores with forested riparian vegetation everywhere except at the south end, where there is a tract of emergent marsh and forested swamp.

Values - The lake has some value as warm-water fish habitat, while the marshes are significant fish and wildlife habitat.

Management - The area has high recreational and scenic value for people living in the immediate vicinity. The marshes should be managed for their natural values. Riparian vegetation should be preserved.

WARRENTON - Site #12 - Goal 17

(Overlay - 1" to 400', #5)

Location - Cemetery Lake, west of Ocean View Cemetery.

Size - Approximately 40 acres.

Vegetation Types - IB, 2, 3, 8, 11

Riparian Vegetation - Very little. The riparian functions on the west side of the lake are fulfilled by a fringe of forested swamp.

Soils - Lake Sediment, Brailier muck.

Site Description - A shallow coastal lake with associated wetlands, formerly continuous with Smith Lake to the south, before construction of the DeLaura Road Causeway. The east bank of the lake has been altered: the cemetery extends to the edge of the water and most of the riparian vegetation has been removed. Moorages have been constructed. The rest of the lake shore is marshy and inaccessible and is in a natural condition.

Values - The lake supports some fishing by local people on the east side. Wetland values are high to the north, south and west. This site has some educational value, since it is one of the few coastal lakes with a good viewpoint (in the cemetery), and is also an aesthetic resource.

Management - The area should be managed to retain these natural low-intensity recreational and aesthetic values.

WARRENTON - Site #13 - Goal 17

(Overlay - 1" to 400', #4, 6, 7)

Location - Several, see map. Alder/Tansy Creeks, Skipanon Slough, Holbrook Slough, Adams and Vera Slough.

Size - Not measured.

Vegetation Types - 1A (IB, 5, 8, 14)

Riparian Vegetation - Extensive, a 301 corridor along the banks of the sloughs.

Soils - Lake sediments.

Site Description - Larger diked sloughs and their associated riparian vegetation in the Goal 17 areas of Warrenton. These are: The Skipanon Slough system, the Alder Slough/Tansy Creek, Holbrook Slough and Adams Slough/Vera Slough (Partly outisde G 17 area). These sloughs are the original natural drainage channels of the Columbia floodplain. Now diked, they form fresh water lakes which drain the surrounding land and discharge through tidegates into the estuary.

Values - Fish, breeding water birds, recreational values, restoration potential in some cases.

Management - Should be managed for wildlife and low-intensity recreation values described above; restoration to the estuary would be appropriate.

WARRENTON - Site #14 - Goal 17

(Overlay - 1" to 400", #5)

Location - Skipanon River between the 8th Street Dam, south to the former Highway 101 bridge.

Size - About 30 acres.

Vegetation Types - 1A, 9

Riparian Vegetation - Some. C. 500 x 50 feet. The forested wetlands area also serves as riparian vegetation.

Soils - Brallier muck and river sediments.

Site Description - This is a largely non-tidal section of the Skipanon River, above the 8th Street dam. It is composed of the river itself, and some forested swamps, which occupy bends in the river and islands.

Values - The river has fisheries value, and the forested wetlands function as wildlife habitat and also as riparian vegetation. The area has scenic and recreational values.

Management - The scenic and natural values of the site should be maintained. The top of the dike between harbor bridge and former Highway 101 bridge would make a fine footpath/bikepath.

WARRENTON - Site #15 - Goal 17

(Overlay - 1" to 400', #7)

Location - The Skipanon River and associated wetlands, south of the former Highway 101 bridge and west of the Highway 101 realignment.

Size - Approximately 60 acres.

Vegetation Types - 1A, 5, 8, 9

Riparian Vegetation - c. 2,000 x 50 feet on the west bank of the Skipanon River from former Highway 101 bridge south to the city limits. A further 2,500 x 50 feet occur south of the city limits and therefore appear to be mostly or all in the County.

Soils - Brallier muck and river sediment.

Site Description - The Skipanon River (mostly non-tidal, above the 8th Street dam) and associated riparian vegetation and marshes. The marshes (and swamps) are on the former pasture, which has been abandoned and has reverted to wetlands. Part of the area was formerly diked, but the dike is now in disrepair. The vegetation appears to be successional, that is, it is still reacting to the change from pasture back to wetland.

Values - Fisheries and education - Warrenton High School maintains a salmon hatchery at this site. The juvenile salmon presumably feed in the Skipanon and in the small channels, which penetrate the marshes, before their release into the estuary. The marshes also have some use by waterbirds. Elk usage of the area is probably reduced since the construction of the Highway 101 realignment, which separates this site from forests to the east.

Management - This site should be managed to maintain or improve fisheries, water-quality, and wildlife/waterfowl values of the Skipanon River.

WARRENTON - Site #16 - Goal 5

(Overlay - i' to 40UT, #7)

Location - Within Warrenton UGB, southern part (undeveloped) of the Aluraax site T8N R10W S34 N%.

Size - c. 100 acres.

Vegetation Types - Most important are: 4, 3, 8, 9, 11

Riparian Vegetation - Upland vegetation (spruce/hemlock/alder forest) bordering on vegetation types 4 and 5 and 11 above sedge marshes and low scrub) is riparian. Similar vegetation bordering types 8 and 9 is not, since most riparian functions are fulfilled by the tall, woody marsh vegetation, c. 5,000 x 50 feet in locations indicated on the overlay.

Soils - The soil at this site is mostly Brallier muck of undetermined depth.

Site Description - A long, narrow swamp which occupies the valley of the Old Skipanon Creek. Drainage is through an old tidegate into the Skipanon River, at the western end of the site. The Skipanon River at this point has a partly tidal, partly non-tidal regime, depending

upon management of the 8th Street dam by Warrenton High School. Drainage of the site is poor, and impounded water accumulates in drainage channels, and in wet sedge marshes and willow swamps. The western part of the site was formerly in agricultural usage, but has been abandoned and has reverted to natural wetland vegetation. The vegetation types resemble those found in the deflation plain wetlands of the Clatsop Plains. This site, however, although on the edge of a sand-dune system, is not a deflation plain wetland: historically, it is probably part of a former tidal lagoon which became filled in with peat as the tidal circulation was reduced and the alluvial plain built up to the west, at the beginning of the post-glacial period. Until recently, it had some tidal influence from the Skipanon River. Similar areas in Warrenton include parts of Site #10.

Values - Fisheries: none. Wildlife: high. Unlike the deflation plain wetlands further west, this site is heavily used by elk, which inhabit the surrounding forests. These appear to use the site for feeding and resting. The lack of human disturbance at this site makes it important for the breeding and feeding of marsh birds. During a site visit, a bittern and herons were noted as well as a large number of yellowthroat and long-billed marsh wrens. There are probably many other species present. Also, at the east end of the site is the only known active osprey nest in the area, which, according to ODFW policy, should receive the same protection as a bald eagle nest site (a primary zone of 300 m radius and a secondary zone of an additional 100 m radius).

Scientific and Educational Value - The site is a good example of a valley bog, although inaccessible at present, and may have a fossil record of the development of the area's vegetation preserved in its peat and sediment deposits.

Management - This site is a significant wetland with high natural and scientific interest. It should be managed to preserve these values.

SITE DESCRIPTIONS - HAMMOND

HAMMOND - Site //1 - Goal 17

(Overlay - 1" to 400', //2)

Location - The western edge of the town, south of 3rd Avenue, west of Russell Drive.

Size - About 45 acres.

Vegetation Types - 4, 8, 10.

Riparian Vegetation - None.

Soils - Warrenton loamy fine sand.

Site Description - A deflation plain wetland with very wet sedge marsh and patches of open water, willow swamp and alder swamp. This site drains through an artificially constructed channel through the sand dune to the west, or directly through the sandy soil whenever the water level falls below the outlet.

Values - A good example of deflation plain wetland with mature marsh and swamp vegetation. Natural habitat for wetland bird and animal species.

Management - This site should be managed to protect the natural values described above, and for low intensity recreation.

HAMMOND - Site #2 - Goal 17

(Overlay - 1" to 400', #2)

Location - Hammond Bog.

Size - About 225 acres.

Vegetation Types - 4, 5, 8, 9, 10, 13, 14

Soils - Mostly Brallier muck. Also Warrenton loamy fine sand and Clatsop silty clay loam.

Site Description - A large area of swamps and marshes continuous with Warrenton Site //10. Together, these two sites (Hammond #2 and Warrenton #10) form a large and significant tract of wetland habitat, with good examples of all of the deflation plain vegetation types except Sphagnum bog. The Hammond site supports extensive willow and alder swamps, and sedge marshes. The site was formerly in agricultural use and peas were raised on the drained Brallier peat: the outline of the old fields can still be seen on aerial photographs. The fields were abandoned and

rapidly converted to natural wetland habitat when the drainage system failed, mainly due to the activities of the large indigenous population of beavers. The site now drains to the north and to the east.

Values - A large tract of natural and semi-natural wetland habitat. The site supports large populations of water birds, particularly mallard, and also mammals such as deer and beaver.

Management - The site should be managed as natural wetland habitat, and for low intensity recreation.

HAMMOND - Site #3 - Goal 17

(Overlay - 1" to 400', it2)

Location - West of Lake Drive.

Size - About 40 acres.

Vegetation Types - 5, 8, 10.

Soils - Warrenton loamy fine sand.

Site Description - A deflation plain wetland system, wettest at the southern end, where there is willow swamp and semi-permanently flooded emergent marsh. The northern end is swamp with saturated soil and [illegible].

Values - This deflation plain is a part of the extensive Clatsop Plains/ Warrenton sand dune system, and has high value as habitat for waterfowl, other marsh birds, deer and aquatic furbearing mammals.

Management - The natural values of this site should be protected.

HAMMOND - Site #4 - Goal 17

(Overlay - 1" to 400', it2)

Location - West of the Mooring Basin.

Size - About 13 acres.

Vegetation Types - 8.

Riparian Vegetation - None.

Soils - Warrenton loamy fine sand.

Site Description - A willow dominated deflation plain wetland with soils saturated or innundated at all times. There are some other wetlands adjacent to the site, forest and shrub dominated, which were found not to be significant because of disturbance and drier hydrological regime.

Values - Part of a large sand dune system, important to waterfowl and other marsh birds.

Management - Natural wetland values of this site should be protected.

SITE DESCRIPTIONS - GEARHART

GEARHART - Site #1 - Goal 17

(Overlay - 1" to 400', #12)

Location - Neacoxie Creek, runs north through the City of Gearhart and its Urban Growth Area. North of 6th Street, the Creek is non-tidal and is described here as a significant wetland. The tidal portion south of 6th Street has already been described by Neal Maine (1979) in the "Necanicum Estuary Inventory."[11] This Goal 16 area has some Goal 17 riparian vegetation which has been mapped for this survey.

Size - About 23 acres.

Vegetation Types - IB, 8.

Riparian Vegetation - The Goal 1/ area is lined by riparian vegetation in places. The total riparian tract measures about 8,800 feet x up to 50 feet. The Goal 16 area has about 5,000 feet x up to 50 feet (see map).

Soil - Marsh.

Site Description - This long, narrow deflation plain once extended from the Necanicum Estuary to Coffenbury Lake in Fort Stevens State Park, but several sections are now drained or filled. The Gearhart Section is a long, narrow ribbon of more or less open or water-weed covered water, lined with willow swamp and by the escarpments of sand-dune ridges.

Values - Waterfowl and warm-water fish.

Management - Neacoxie Creek should be managed to protect its wetland and riparian values.

GEARHART - Site #2 - Goal 17

(Overlay - 1" to 400', #12)

Location - Immediately west of Highway 101, from the drive-in theater to the northern edge of the urban growth boundary, interrupted in the middle by a filled area which divides the site into a northern and a southern section.

Size - Northern Section, c. 16 acres; Southern Section, c. 21 acres.

Vegetation Types - IB, 2, 4, 5, 8.

Riparian Vegetation - None

Site Description - A diverse wetland system, some of the area is semi-permanent standing water while the remainder is seasonally flooded and saturated at other times. There is no visible outlet and the system must drain through the sand dunes. The northern section is two narrow, semi-permanent parallel lakes lined with willow swamp. The southern portion is broader and includes open water and sedge marshes partly lined with willow swamp.

Values - Waterfowl and possibly some warm-water fish.

Management - The site should be managed to protect its natural wetland values.

GEARHART - Site #3 - Goal 5

(Overlay - 1" to 400', #12)

Location - East of the old railroad and north of Palmberg Sand & Gravel yard.

Size - About 15 acres.

Vegetation Types - 5, 8, with patches of reed canary grass.

Riparian Vegetation - None.

Soils - Brallier Muck.

Site Description - This is the southern end of a 400 acre wetland site, most of which lies in Clatsop County (CP 16). This site is the best example of native peat-bog habitats in the area, with good examples of Sphagnum bog, Spiraea bog, sedge marsh and willow swamp, of which the latter two vegetation types are represented in the Gearhart portion. The site shows evidence of former cultivation, but has now reverted to natural wetland with saturated, seasonally inundated and

intermittently exposed soils. The site is heavily used by marsh birds and raptors, and also by elk which enter freely from the forest lands to the east.

Values - This 400 acre site has high scientific interest as the County's best example of a coastal peat bog. It has some value for water fowl and is heavily used by elk. The Gearhart portion is swamp/marsh, is wetter than the rest of the site and has heavier waterfowl and lower elk usage.

Management - The site should be managed to protect its natural wetland and scientific values.

GEARHART - Site #4 - Goal 5

(Overlay - 1" to 400', //12)

Location - East of McCormick Gardens Road, down past the airport, where it joins the Goal 17 Stanley Lake Wetlands. Two portions of this site are in the Gearhart Urban Growth Boundary.

Size - The two Gearhart portions measure: North, 2 acres and South, 7 acres out of a total site area of 130 acres.

Vegetation Types - 5, 8, also cat-tail and reed canary grass marshes.

Riparian Vegetation - None.

Soils - Brallier Muck.

Site Description - An area of emergent marshes and low shrub/sedge marshes with a variety of marsh plants in an area which is seasonally inundated to semi-permanently flooded. There is also some willow swamp. These wetlands line the creek which flows east of the airport to join the Stanley Lake outlet and discharges through a tidegate into Neawanna Creek.

Values - Waterfowl and marsh bird usage, probably warm-water fish in the creek.

Management - The site should be managed to protect its values as a natural wetland ecosystem.

SITE DESCRIPTIONS - SEASIDE

SEASIDE - Site #1 - Goal 17

(Overlay - 1" to 400', #14 and 16)

Location - Circle Creek wetlands, west of the Necanieum River and south and west of the golf course. This Goal 17 wetland has c. 140 acres in the City of Seaside, 18 acres in the Seaside UGB, and 20 acres in Clatsop County.

Size - Total area of 178 acres (see above for breakdown by jurisdiction).

Vegetation Types - 2, 8, 9.

Riparian Vegetation - None.

Soils - Brenner silt loam, Nestucca silt loam.

Site Description - This site is a poorly drained, low-lying part of the Necanieum floodplain. It is separated from the ocean by the bar which supports Ocean View Way, and from the Necanieum River, into which it drains. It is mostly separated by the more elevated land adjacent to the river. Site is a typical natural river floodplain wetland for this region. The vegetation is mostly willow and spruce swamp, and the site has some fine old-growth spruce trees. It is enhanced by areas of emergent marsh and shallow water-lily covered lakes along Circle Creek, which meanders through the site.

Values - Fisheries - none. Wetland use by birds, deer, elk and other animals, high. Scientific: a good example of a natural riverine flood plain wetland.

Management - This site should be managed for its natural wetland values: the old growth spruce trees should be protected.

SEASIDE - Site #2 - Goals 17 and 5

(Overlay - 1" to 400', #14)

Location - Upper Neawanna, south of Sundquist Road and east of the Mill Ponds, in the Seaside UGB.

Size - Seaside UGB portion is 27 acres.

Vegetation Types - 8. Also emergent marshed which resemble the tidal marshes of the Neawanna described by Maine (1979), on page B-16, marsh type #13.

Riparian Vegetation - None.

Soils - Brenner silt loam.

Site Description - This site is adjacent to the Goal 16 area of the Neawanna River described by Maine. As mapped, a small and undetermined area at the North end of the site is estuarine. This site is part of a large headwater swamp on the Neawanna River in the Seaside UGB and in Clatsop County. Two existing industrial uses make this a difficult area to map: in the Seaside UGB, the mill ponds have been excluded from the wetland site, while in Clatsop County, gravel is being extracted. The area of active and proposed gravel extraction is also excluded. Overall, the site resembles S 1, with extensive willow and spruce swamps enhanced by patches of emergent marsh and small lily ponds. The site is dissected by several small creeks.

Values - Fisheries - a natural coho run of undetermined size is reported for the Neawanna by Maine. These probably breed in this headwater swamp. The area has high value as wetland habitat for birds and mammals.

Management - The natural wetland values of this site should be protected, except for the excluded areas where existing industrial uses are occurring.

SEASIDE - Site #3 - Goal 17 and 5

(Overlay - 1" to 400', #13 & #14)

Location - Mill Creek and Stanley Lake marshes, from Seaside Airport south to the new entrance road to Trails End. City of Seaside and Seaside UGB.

Size - 67 acres.

Vegetation Types - IB, 2, 4, 5, 8, 14

Riparian Vegetation - None.

Soils - Brallier muck, Bergsvik muck, Brenner silt loam.

Site Description - This site comprises a shallow coastal lake (Stanley Lake) and associated wetlands. Since Stanley Lake expands and floods much of this site during wet seasons, most of the area falls under Goal 17. The site consists of the permanently flooded lake area, surrounded by very wet Sitka sedge marshes and extensive areas of willow

swamp and slough sedge marshes. Some of the marsh areas were formerly farmed, but have now reverted to natural wetland, though in some areas a disturbed marsh flora is still present. The area has heavy use as wetland habitat by birds, particularly waterfowl, and is also reported to have a salmon run by Maine. He included Stanley Lake under Goal 16 because of some salinity intrusion through the tidegate under Highway 101. It is probably more correct to regard the area as a Goal 17 wetland, since the tidal influence appears to be negligible.

Values - Waterfowl: some value as a salmon spawning area (coho) and probably some warm-water fish.

Management - The area should be managed to protect its natural wetland values.

SEASIDE - Site #4 - Goal 17

(Overlay - 1" to 4001, #14 & #16)

Location - Necanicum River, from head of tide, south to City limits.

Vegetation Types - None.

Riparian Vegetation - A zone of riparian vegetation, comprising shrubs and trees is present along both banks of the Necanicum River. The width of this zone varies from zero, where pasture runs right down to the water line, to a maximum of 501 wide where sufficient woody vegetation is present. In most places, the riparian zone is a narrow (10-201) band on the river bank.

Site Description - The Necanicum River has important natural values, particularly for salmonoids and some species are stocked. Water quality is enhanced by the riparian vegetation described above. The portion of the river in Clatsop County has similar values.

Management - The site should be managed to protect its fisheries values and to protect the riparian vegetation.

SITE DESCRIPTIONS - CLATSOP COUNTY (PLAINS)

CLATSOP COUNTY - Site #CP 1 - Goal 17

(Overlay - ln to 400', #1 & #3)

Location - Clatsop Spit, west of Battery Russell and the old military road west of Swash Lake, south to Warrenton City Limits.

Size - 1,330 acres.

Vegetation Types - 6 and 7.

Riparian Vegetation - None.

Soils - Sand dune soils.

Site Description - This enormous site is a mosaic of young deflation plain wetlands and sand dunes mostly of rather low elevation. The deflation plains are mostly dominated by slough sedge and hooker willow; they are flooded in winter and spring by high water tables, and also by very high tides. In summer, the sandy soil may be saturated or moist. A well developed young dune/deflation plain flora is present. The uplands are dominated by grass, principally introduced beach grass, and also some scrub. Black-tailed deer are present together with many smaller aquatic and terrestrial mammals. The area is important to avifauna, particularly migrating and overwintering populations. Many rare species have been recorded. It is important habitat for raptors, and has a resident population of marsh hawks and occasional use by many other species.

Values - The area is important to pelagic birds during stormy weather. Endangered snowy plovers have nested here, particularly west of parking lot C. The area has been identified as important habitat by the Nature Conservancy, and as one of the State's most important bird-watching areas.

Management - The natural values of this site should be preserved. This protection is compatible with low-intensity recreation. Use of off-road vehicles should be discouraged in the sand dunes, deflation plains and estuarine intertidal areas. Suitable designations are natural aquatic and shoreland, and conservation aquatic and shoreland. Also, the salt marsh adjacent to parking lot C (Goal 16), which is very important to water birds, should be protected.

CLATSOP COUNTY - Site //CP 2 - Goal 17

(Overlay - 1" to 400', #3 and //2)

Location - Areas surrounding Swash Lake to the east and south.

Size - About 175 acres.

Vegetation Types - 9, 10, 7

Riparian Vegetation - A zone of scrub and trees up to 50' wide around the eastern end of Trestle Bay: about 5,600 feet.

Soils - Sand dune soils.

Site Description - This area supports relatively mature sand-dune vegetation, with a mosaic of wetland and upland areas. The deflation plain wetlands are forested and large areas are inundated by the highest tides. Because the major hydrological influence is the sand-dune water table, these wetlands were judged to be Goal 17, not Goal 16. Isolated dunes and dune ridges in this site support spruce/hemlock forest and are significant as riparian and upland habitats for birds and mammals. This site is in a complex area of great habitat diversity, closely associated with the Swash Lake estuarine area. It is important to deer, aquatic furbearers and to wetland bird species. The site also includes three areas of forested swamp on the south side of Jetty Road.

Values - Part of natural mature sund-dune ecosystem, in close proximity to the estuary.

Management - The natural values of this site should be preserved.

CLATSOP COUNTY - Site //CP 3 - Goal 17

(Overlay - 1" to 400', #8, 9, 10, 11, 12)

Location - The fore-dunes between the Narrenton City Limits and Gearhart UGB.

Size - About 650 acres.

Vegetation Types - None, significant shoreland (dune grassland)

Riparian Vegetation - None.

Soils - Sand-dune soils.

Site Description - The values of the Clatsop Plains foredunes as significant wildlife habitat are given in the introduction to this project. This coastal habitat is of recent origin, and was stabilized by the

USDA, forming a semi-natural coastal grassland. There are also some areas of scrub and low trees, which provide additional habitat diversity.

Values - Part of a coastal sand-dune ecosystem, significant grassland.

Management - This area should be preserved as semi-natural grassland habitat. Apart from a limited number of access road to the beach, this area is suitable for low-intensity recreation. Further development of housing on these dunes is likely to be incompatible with protecting their natural values. Off-road vehicle use of the area should be controlled to prevent the loss of vegetation cover.

CLATSOP COUNTY - Site #CP 4 - Goal 17

(Overlay - 1" to 400', #8 & #9)

Location - The first deflation plain, east of the westernmost dune ridges. Extends from the City of Warrenton limits to the north, southwards to Camp Rilea.

Size - 120 acres.

Vegetation Types - 6 and 7.

Riparian Vegetation - None.

Soils - Sand dune soils.

Site Description - A large deflation plain of relatively recent origin. At c. 18-22 feet above MSL, these wetlands are flooded at wet times of the year, particularly winter and spring, and dry out during the summer. The sandy soil has poor moisture retaining capacity. The vegetation is mostly dominated by slough sedge and hooker willow, while numerous small isolated dunes support upland vegetation. The main value of these wetlands is that they are part of a large, more or less natural coastal ecosystem: they are less valuable per acre than wetlands further inland. Wildlife use is by amphibians, small mammals, deer and many bird species, particularly birds of prey.

Values - Breeding and feeding of wetland birds, scientific/educational value as part of a coastal ecosystem.

Management - Preservation of these natural values is compatible with some recreational use: use of the beach areas requires a limited number of access routes to traverse these wetlands.

CLATSOP COUNTY - Site //CP 5 - Goal 17

(Overlay - 1" to 400', //9 & //10)

Location - Deflation plain wetlands (including Slusher Lake) west of Sunset Lake.

Size - About 104 acres.

Vegetation Types - IB, 6, 7.

Riparian Vegetation - A zone up to 501 wide and about 4,000 feet long surrounds perennially and seasonally inundated areas (see maps).

Soils - Sand dune soils.

Site Description - West and south of Camp Rilea, the first and second deflation plains, behind the foredune area, are discontinuous. Instead of the large slough-sedge areas found further north, these are hollows in the dunes filled with slough sedge and hooker willow wetlands, and often containing coastal lakes. The largest of these is Slusher Lake, but there are several others which are perennially flooded. These lakes have some warm water fish and waterfowl values, while the associated swamps and marshes are used by waterfowl and other wetland birds. South of this site, the first deflation plain peters out gradually in a series of small, seasonally inundated puddles. These were not found to be significant.

Values - This site has waterfowl and some fisheries value and is part of a large coastal ecosystem.

Management - The natural values of this site should be preserved.

CLATSOP COUNTY - Site //CP 6 - Goal 17

(Overlay - 1" to 400', //8)

Location - West of Ridge Road, south of Columbia Beach Road to Camp Rilea.

Size - 96 acres.

Vegetation Types - IB, 2, 4, 5, 8, 9.

Riparian Vegetation - These shallow lakes are lined with a 501 wide fringe of riparian vegetation, extending for about 35,000 feet.

Soils - Marsh soils and lake sediments.

Site Description - A large shallow lake occupying two parallel deflation plains with a discontinuous dune ridge between them. This is a diverse wetland system, with large expanses of shallow water, sedge marshes,

willow and spruce swamp and riparian vegetation. Since this area is permanently flooded, it supports populations of warm-water fish. The shallow marshy nature of this lake makes it unsuitable for fishing, but it is used extensively by waterfowl, particularly American widgeon. It probably supports breeding populations of waterfowl, such as mallard and wood duck, as well as other wetland bird species. The southward extension of this lake is narrow and long and is lined with trees. It should also contain warm-water fish, and is important to breeding water birds. An isolated four acre "puddle" (c. 400 feet west of the main site) with standing water, sedge and willow swamp, is also included in this site. It also has some importance to wetland birds.

Values - Important to waterfowl and aquatic mammals.

Management - This is a fine example of a shallow coastal lake and should be managed to maintain its natural values. Care should be taken to ensure that excessive eutrophication of this lake from septic tank leachate does not occur. The very extensive and well-developed riparian vegetation should be preserved.

CLATSOP COUNTY - Site #CP 7 - Goal 17

(Overlay, 1" to 400', #8 & #9)

Location - Smith Lake

Size - c. 98 acres.

Vegetation Types - IB, 2, 4, 8.

Riparian Vegetation - The lake is lined with riparian vegetation (mostly trees) in a belt up to 501 wide and about 11,000 feet long.

Soils - Lake sediments and marsh soils.

Site Description - This site consists of two parallel deflation plains. The smaller one to the west is shallow, weed-filled water surrounded by swamps and marshes. The larger one to the east is connected to the first in several places by swamps, and contains the large but rather shallow Smith Lake. This lake is mostly open water which becomes weed filled in summer; fringing marshes and swamps are narrow except at the southern end. It has heavy recreation usage from the surrounding property owners, and is reported to support several species of warm-water game fish. It is also an important overwintering area for waterfowl, principally coot and American widgeon, which may number many hundreds.

Values - Fisheries, recreational warm-water game fish, overwintering waterfowl.

Management - The important fisheries and waterfowl values should be protected, while allowing for continued recreational use and other uses (such as water rights). Efforts should be made to preserve the remaining riparian vegetation which has been heavily impacted by lake shore developments. Further eutrophication of the lake should be prevented and management such as water-weed removal could be considered if it becomes excessivly choked with vegetation.

CLATSOP COUNTY - Site #CP 8 - Goal 17

(Overlay - 1" to 400', #9)

Location - South of Warrenton High School, East and West of the railroad.

Size - About 67 acres.

Vegetation Types - 4, 5, 8, 9, 10.

Riparian Vegetation - 1,000 feet x 50 feet along the Skipanon to the south of the wetland area.

Soils - Brallier muck.

bite Description - An area of mostly forested wetlands with some emergent marsh, adjacent to the Skipanon River. Besides fulfilling riparian functions, these wetlands are extensively used by wetland and upland avifauna, by aquatic furbearers and by deer.

Values - Some wildlife value; a riparian zone along the Skipanon River.

Management - The natural values of this site should be protected.

CLATSOP COUNTY - Site //CP 12 - Goal 17

(Overlay - 1" to 400', #10 & #11)

Location - West Lake. This lake is crossed by Highway 101 and the associated wetlands extend southwards beyond the southern end of the Delmoor Loop.

Size - About 126 acres.

Vegetation Types - IB, 2, 4, 8, 13

Riparian Vegetation - A zone up to 50′ wide is present in places around the lake, length c. 11,000 feet.

Soils - Lake sediments and Brallier muck.

Site Description - A coastal lake of medium depth, with its associated marshes and swamps. At high water periods, these wetlands are inundated with lake water. This lake is reported to support recreational fishing for warm-water game fish. Waterfowl, particularly coot, overwinter on this lake; probable breeding species are coot, hooded merganser, wood duck, pied-billed greve and mallard. Purple herons are sometimes seen here.

Values - Warm-water game fish and waterfowl.

Management - The natural values of this site should be preserved.

CLATSOP COUNTY - Site #CP 11 - Goal 17

(Overlay - 1" to 400', #9, #10 & #11)

Location - Sunset Lake.

Size - About 130 acres.

Vegetation Types - 1A, IB, small areas of marsh swamp.

Riparian Vegetation - Scrub and trees, a zone up to 50' wide is present but has been heavily impacted by agricultural and suburban developments.

Soils - Lake sediments.

bite Description - One of the largest and deepest coastal lakes. bunset Lake is about 16,500 feet long, up to 640 feet wide and up to 19 feet deep. This lake supports populations of warm-water fish and there is a large recreational fishery. Waterfowl are often abundant, besides the large domestic flocks, and in bad weather, the lake is used for shelter by pelagic ocean species.

Values - Recreational fishing and overwintering and breeding of waterfowl; boating and swimming. Fish are stocked.

Management - The natural values of this lake need to be protected to ensure its continued recreational value. Eutrophication may be a problem in the future if the number of septic tanks increases, but does not appear to be a problem at present. The continuing loss of riparian vegetation is a serious problem: further loss should be prevented and extensive restoration of riparian vegetation would be appropriate. The proliferation of single-purpose docks may become a problem here.

CLATSOP COUNTY - Site #CP 10 - Goal 17

(Overlay - 1″ to 400′, #8, #9 & #10)

Location - A long narrow coastal lake (c. 15,600 ft.) interrupted by at least 6 road fills. Extends from Columbia Beach Road to Smith Lake southward through Camp Rilea, between the golf course and Highway 101, and beyond Sunset Beach Road.

Size - About 73 acres.

Vegetation Types - IB, 2, 3, 4, 8, 11 (wet var.).

Riparian Vegetation - This system of shallow lakes is lined by a zone of riparian vegetation up to 50′ wide and 20,000 feet long.

Soils - Marsh soils and lake sediments.

Site Description - At their widest places these lakes have extensive sedge and water-lily marshes with weed-filled water and swampy patches. Where they are narrow, they become weed-filled water overhung by willows and riparian vegetation. The shallow water presumably supports populations of warm-water fish. Aquatic fur-bearing mammals such as beaver and nutria are present. The site supports a great diversity of water birds. Breeding waterfowl include mallard, wood duck and hooded merganser, with these and many other species overwintering here. Other residents include bittern and kingfishers. These lakes apparently received little disturbance, but are becoming choked with water weed in places, probably from septic tanks and fertilizer leachates.

Values - The lakes are important to breeding, migrating and overwintering waterfowl and marsh birds, and to aquatic furbearers.

Management - This is a fine example of shallow coastal lakes with associated marshed, swamps and riparian vegetation. These natural values should be protected.

CLATSOP COUNTY - Site #CP 9 - Goal 5

(Overlay - 1" to 40019 #7 & #9)

Location - Along the Skipanon River: south of Warrenton and SE of Highway 101 realignment.

Size - About 98 acres.

Vegetation Types - 5, 8, 11 (dry var.), 9.

Riparian Vegetation - About 2,000 feet x 50 feet along the Skipanon, north of the wetlands.

Soils - Brallier muck.

Site Description - This peat bog site was apparently farmed in the past, but has since reverted to native wetland vegetation. The Skipanon River which passes through this site, supports populations of warm-water fish. The swamps to the east of the Skipanon are extensively used by elk. The bog area is important habitat for wetland avifauna and probably supports populations of aquatic furbearers.

Values - This is a good example of a coastal peat bog, though it is probably of lower value than CP 16.

Management - The Goal 5 process should be applied to this site to assess the possibility of protecting its riparian and natural wetland values.

CLATSOP COUNTY - Site #CP 13 - Goal 7 goal 3

(Overlay - 1" to 400', #10 and Gearhart Quad.)

Location - Taylor Lake, north of Cullaby Lake.

Size - About 17 acres.

Vegetation Types - 1A, 1B, 0, 10, 0

Riparian Vegetation - 2,500 feet x 50 feet wide around the lake (see quad sheet).

Soils - Brallier muck, lake sediments.

Site description - This fairly deep, clear lake supports populations of warm-water game fish and has some use for sport fishing. A forested swamp to the SW within 500 feet of the lake was judged to be significant wetland, and the lake is lined with a forested riparian zone. The forested wetland area is used by deer and elk, aquatic furbearing mammals, and is likely to be important habitat for breeding and feeding of wetland birds. There is also a small marshy area to the east of the lake. The lake was described as Nature Conservancy Site #15 for Clatsop County and the NC also described the surrounding hillside as part of the site. Except for the 501 riparian zone, this hillside was not included in this study, since an evaluation of the natural resources of Clatsop Ridge was beyond its scope.

Values - Warm-water game fish; some value to wetland birds.

Management - This site is little disturbed, more or less pristine wetland area despite its relatively small size. The marshes, swamps and riparian vegetation around the lake should be preserved.

CLATSOP COUNTY SITE fCP 14 - Goal-lT jt aJ. S

(Overlay - 1" to 400', #10 and #11 and USGS Gearhart Quad Sheet.)

Location - Cullaby Lake.

Size - 280 acres.

Vegetation Types - 1A, 5, 8, 9, 11 (dry var.)

Riparian Vegetation - 20,000 feet x 50' wide, particularly on the eastern side of Cullaby Lake.

Soils - Brallier muck, lake sediments.

Site Description - Cullaby Lake has the largest area of any coastal lake in the Clatsop Plains: it appears to be the remnant of a much larger lake or lagoon which has been filling in with peat since its separation from the ocean. It currently has a high level of recreational usage, and supports a recreational warm-water game fishery. It has some value to overwintering and breeding waterfowl. The south end of the lake was described as having a great variety of avifauna by the Nature Conservancy (Clatsop County Site #16). In addition, peat bogs on the western side of the lake within the Goal 17 area were found to be significant. Some of these previously supported agriculture, probably cranberry growing, but have since reverted to scrub or emergent wetlands and are used extensively by wetland avifauna and by raptors.

Values - Warm-water game fishery; waterfowl and wetland birds.

Management - The natural values of the lake should be protected in order to maintain its high recreational value. The riparian vegetation, fringing marshes and significant bog areas should all be protected.

CLATSOP COUNTY - Site #CP 15 - Goal 5

(Overlay - 1" to 4001, #10 & #11)

Location - Between Cullaby Lake and Highway 101.

Size - About 230 acres.

Vegetation Types - 5, 8, 9, 11 (dry var.)

Riparian Vegetation - None.

Soils - Brallier muck.

Site Description - This large peat bog site is a westerly extension of the significant Goal 17 peat bog areas which line the west side of Cullaby Lake. The peat, which has filled in a former lake basin, has powerful water-retaining properties, and the surface is saturated for much of the year. It can, however, be used for agriculture, particularly cranberry growing and some of the site appears to have been so used in the past. It has now reverted to native wetland vegetation. These peat bogs are important to wetland animals, particularly avifauna, and the southern end of this site is extensively used by elk.

Values - Wetland animals; natural and semi-natural peat bog wetlands.

Management - This site is a good example of a coastal peat bog. Examples of this wetland type should be preserved.

x CLATSOP COUNTY - Site #CP 16 - Goal 5

(Overlay - ln to 400', #11 & #12)

Location - East of Highway 101 from the south end of the Dellmoor Loop Road, south co Paimberg Gravel works.

Size - About 380 acres (including 15 acres in Gearhart G 3).

Vegetation Types - 4, 5, 8, 9, 11 (dry var.) 12, 13.

Riparian Vegetation - None

Soils - Brallier muck.

Site Description - This site is the best example of a coastal peat bog on Brallier muck in the County. The northern end approaches the raised bog condition dominated in places by the moss Spagnum, a rare community in this area, and also by various shrubs and stunted trees. To the south, the site becomes much wetter and considerable areas are at least seasonally inundated. The southern half in particular, is used by breeding waterfowl, while the central and northern portions have heavy elk use. There is a great diversity of avifauna, throughout, including many wetland species despite the scarcity of open water. The site shows evidence of former cultivation, but has since reverted to native wetland vegetation.

Values - Wetland animals, particularly avifauna and elk. The site has high scientific and educational value as a fine example of a peat bog:

the post-glacial vegetation history of the area is probably contained in fossils in the deep peat.

Management - The high natural values of this site should be protected. Preservation of this site as the best example of a coastal peat bog in the area would be appropriate.

CLATSOP COUNTY - Site #CP 17 - Goal 17

(Overlay - 1" to 400', #11 & #12)

Location - West of Highway 101, North of Gearhart UGB, North and South of DelRey Beach Road and north and south end of Surf Pines Road. A northwards extension of Gearhart Sites #1 and 2.

Size - 30 acres.

Vegetation Types - IB, 4, 5, 8, 14.

Riparian Vegetation - None

Site Description - This site is a continuation of the long, narrow deflation plain described under "Gearhart Site #1" in this report. Together, these two sites link Sunset (Neacoxie) Lake to the Neacoxie estuary. Also included are the small northwards extensions of Gearhart Site #2, immediately west of Highway 101, and wetlands, although part of a separate deflation plain system, have very similar characteristics to this one. These areas have shallow lakes, presumably with some warm-water fish, marshes, and willow swamps, with wetland birds. The northern end has been impacted in the past through attempts to drain the site and the destruction of riparian vegetation.

Values - Part of an extensive deflation plain/coastal lake system which extends from the Necanicum estuary northwards to Sunset Lake. Before extensive filling in Camp Rilea, it extended to Coffenbury Lake. The system has fisheries, waterfowl and other wetland values.

Management - The natural wetlands values of this site should be preserved.

CLATSOP COUNTY - Site #CP 18 - Goals 4 and 5

(Overlay - 1" to 400', #11 and USGS Gearhart Quad.)

Location - 2 small lakes and adjacent wetlands on Cullaby Creek, 4,000 feet south of Cullaby Lake.

Size - 120 acres (Goal 4) 40 acres (Goal 5).

Vegetation Types - IB, 4, 5, 8, 9, 2.

Riparian Vegetation - About 4,000 feet x 50 feet along Cullaby Creek.

Soils - Brallier muck.

Site Description - This area has great habitat diversity, with open water, marsh and swamp habitats, all well represented. The swamp/upland boundary to the NE of this site was not accurately determined. The lakes are connected to Cullaby Lake via Cullaby Creek and support populations of warm-water game fish. The surrounding marshes and swamps are important to breeding waterfowl and other wetland birds, and have some importance to overwintering waterfowl. The swamp areas are extensively used by elk. The upper part of Cullaby Creek, south of the Goal 17 area, has about 40 acres of scrub and forested swamps. Since this area is adjacent to the Goal 17 area and shares similar natural values, it is logical to manage the two areas as a single unit.

Values - Warm-water fish, breeding wetland birds, habitat diversity.

Management - The natural values and habitat diversity of this site should be protected.

CLATSOP COUNTY - Site #CP 19 - Goal 5

(Overlay - 1" to 4001, #12 & #13)

Location - North of the road to the Crown Site, up to the Palmberg Gravel Company, east of Highway 101 and Seaside Airport.

Size - About 130 acres (5 acres in Seaside UGB, 9 acres in Gearhart UGB-G4).

Vegetation Types - 5, 8, 9, also marshes dominated by cat-tails and reed canary grass.

Riparian Vegetation - None.

Soils - Brallier muck.

Site Description - A system of very wet marshes lining Mill Creek with adjacent swampy areas to the east. These marshes were apparently farmed in the past, but the water table has subsequently risen so that the area now supports native marsh vegetation and swamp. The site has a large area of emergent wetland, and is therefore suitable habitat for the breeding of wetland birds, including waterfowl, such as mallard. Woodduck probably nest in the swamps. Populations of elk and aquatic furbearing mammals are present.

Values - A large area of emergent and forested wetland, probably an important site for wetland birds and for elk.

Management - The natural habitat values of this site should be protected.

CLATSOP COUNTY - Site #CP 20 - Goal 5

(Overlay - 1" to 4001, #14)

Location - Southeast of Seaside, south of the Mill ponds, east of Highway 101.

Size - About 132 acres (27 in Seaside UGB - Site #S 2).

Vegetation Types - IB, 2, 5, 8, 9.

Riparian Vegetation - None.

Site Description - This headwater swamp on the Neawanna is dissected by several small creeks, which support a small natural run of coho salmon (Maine). The swamps which also act as riparian zones around these creeks and the mill ponds are important elk habitat and are important habitat for nesting and feeding wetland birds species, probably including some waterfowl breeding.

Values - Natural wetland values: wetland avifauna, fish, including sarmon spawning.

Management - The preservation of part of this site is pre-empted by an existing permit for gravel extraction: the exact area to which this permit applies was not determined. The natural values of this site should be protected as far as possible.

SITE DESCRIPTIONS - CLATSOP COUNTY (LEWIS & CLARK & YOUNGS RIVER)

CLATSOP COUNTY - Site #LY 22 - Goals 17 and 5

(Overlay - See attached map)

Location - Youngs River, Lewis and Clark River, tidegated sloughs (see map, 1:24,000). About 22 sloughs, including Johnson, Peterson, Green, Barrett, Jeffers, Knowland, Cook, Binder, Casey, Tucker Sloughs, and others not named on the USGS Quad.

Size - Not determined.

Vegetation Types - 1A, IB, 5, 8.

Riparian Vegetation - Extensive, but not mapped. A zone up to 301 wide (where present) of trees and shrubs lines the shores of these sloughs.

Soils - Lake sediments.

Site Description - These former tidal sloughs are now tidegated and are effectively lakes. They now serve to drain floodplain pasture, and also have considerable natural values. They are deep enough to support populations of warm-water fish, and also have value to waterfowl, particularly nesting woodduck.

It is debatable how much of this resource is covered by Goal 17. The best solution is to treat the whole site as a Goal 17 resource.

Values - Warm-water fish and waterfowl.

Management - The sloughs should be protected, while provision should be made for their function as drainage channels. The riparian vegetation should be protected.

CLATSOP COUNTY - Site #LY 23 - Goal 17

(Overlay - See attached map)

Location - Youngs River/Lewis and Clark River: wetlands, wildlife habitat and riparian vegetation. Wetland sites are Haven Island and near Fort Clatsop.

Size - Not determined.

Riparian Vegetation - A band of riparian vegetation up to 501 wide is present in many places along these two rivers (see map, 1:24,000 feet for major tracts).

Site Description - (1) A forested swamp c.ll acres, probably with some tidal interference, lies to the north of Fort Clatsop adjacent to the Lewis and Clark River. (2) South of Fort Clatsop and west of the road, a 550 acre poorly drained floodplain site has reverted to marsh and may have some tidal influence. (3) Haven island, a 60 acre site in Youngs River of which about 20 acres are wetland and the remainder is significant wildlife habitat on account of its isolated location in the river, remote from human disturbance, which gives it importance to waterfowl and to aquatic furbearers.

Values - These sites are important habitat for waterfowl and aquatic mammals, particularly so because of proximity to parts of the Columbia River Estuary.

Management - These areas should be protected as significant wetland and wildlife habitat. Restoration to the Estuary would be suitable in sites (1) and (3). Riparian vegetation should be protected.

SITE DESCRIPTIONS - CLATSOP COUNTY (EASTERN COUNTY)

CLATSOP COUNTY - Site #EC 26 - Goals 17 and 5

(See CREST Plan)

Location - Columbia River dredge-spoil islands; east and west Sand Island, Lois and Mott Islands, Rice Island, Miller Sands, Jim Crow Sands.

Vegetation Types - Mostly uplands; wetland vegetation types 6 and 7 are present on West Sand Island.

Riparian Vegetation - 50' wide zone surrounds Lois and Mott Islands, the older part of Miller Sands and parts of East and West Sand island.

Soils - Dredge spoils.

Site Description - These sites, mostly upland, have considerable value to estuarine wildlife. In particular, unstabilized sandy areas are used by breeding seagulls on East Sand Island, Rice Island and the sand spit on Miller Sands.

These islands also support populations of aquatic furbearers, and are especially important to these animals at high tide. Trees on these islands are important for the roosting of birds of prey, including bald eagles and herons. Caspian terns probably nest on Miller Sands and possibly elsewhere.

Values - These islands, which are inaccessible and relatively undisturbed uplands, are important to estuarine wildlife because they provide habitat diversity.

Management - These areas are all designated "Conservation Shoreland" in the CREST Plan. This is a suitable designation to protect the values

of these sites. Continued dredge spoil disposal is compatible with wildlife values, particularly if spoiling avoids the nesting period of seabirds in colony areas. Revegetation of these sandy uplands should be avoided where possible, to maintain this valuable nesting habitat.

CLATSOP COUNTY - Site #EC 27 - Goal 17

(See CREST Plan.)

Location - Tongue Point.

Size - Not measured.

Riparian Vegetation - 50' wide zone along the shoreline.

Site Description - Mature forest and riparian vegetation: scenic and historical area; bald eagle nesting site. Already designed "Natural Shoreland" in the CREST Plan: this is suitable to protect natural values.

CLATSOP COUNTY - Site #EC 28 - Goals 17 and 5

Location - John Day River: 5 wetland areas (see attached map).

Size - 16, 30, 49, 25, and 62 = 182 acres.

Vegetation Types - 1A, 4, 5, 9, 11 (wet var.) - See Clatsop Plains Study.

Riparian Vegetation - Extensive riparian zones (501 wide) line the marshes and the John Day River (see map).

Site Description - The five sites are as follows:

(i) On the north side at c.RM15, a well developed hackberry swamp straddles Highway 101 (16 acres).

(2) On the south side, post RM2, a 30 acre hackberry, sedge and spruce swamp occupies the valley of a small tributary.

(3) At c.RM3.5, a small creek runs southwards and the upper reach is tidegated. Of the tidegated portion, the northern part is poorly managed wetland pasture, while the southern end is natural swamp vegetation.

(4) At the head of the River, beyond RM4, are extensive swampy areas. The SE arm is a long marsh/swamp in pristine condition (c. 25 acres). This is one of the few areas where a natural transition from tidal to non-tidal marsh can be seen; it also shows a good wetland/upland transition, since some of the surrounding forest is mature.

(5) The upper, tidegated portion of the John Day spreads into 3 creeks across a broad floodplain. Part of this is badly managed wetland pasture, while the remainder is swamp and marshes supporting natural vegetation. This was not included as a restoration site but would be very suitable for this purpose. The CREST Plan did note potential for fisheries enhancement, however. These wetlands have important function as feeding and nesting habitat for birds, and as habitat for aquatic furbearers, deer and elk. They have small populations of warm-water fish in the tidegated sloughs. Those fisheries values would be greatly enhanced by restoration, and this is an area where relatively minor actions, involving the loss of marginal agricultural land, would result in major benefit to the estuary. Potential also exists for an extended riparian zone in the mature upland forests which surround these sites.

Management - Suitable designations would be: (1) Conservation or Natural Aquatic; (2) Conservation or Natural Aquatic; (3) Conservation Aquatic; (4) Natural Aquatic; (5) Conservation Aquatic.

Riparian vegetation should be preserved; the restoration of Sites 1, 2, 3, 5 to the estuary is recommended.

The John Day River is a short, tidal slough into which drain numerous small creeks, each with its own short floodplain. The result of this is a complex area with very high habitat diversity, and important riparian functions. These are the estuarine functions which have been most extensively impacted in the past, and the area therefore has very high restoration potential. This was recognized in the CREST Plain, which included some of these sites in mitigation/restoration areas, namely:

(1) was included in 31 (M)
(2) was included in 32 (M)
(3) was included in 35 (M)

NOTE: Shoreline corrections: Tidal swamps which were not identified in the CREST Plan are marked "T" on the map of this area. These wetlands are in the Goal 16 area.

CLATSOP COUNTY - Site //EC 29 - Goal 17

(See attached map)

Location - John Day Point to Knappa Dock

Riparian Vegetation - Up to 5QT wide zone along the CR and around areas of fringing marshes.

Site Description - Significant wetlands were identified in the following locations:

(1) Two small marsh areas east of John Day Point - probably some tidal influence (c. 10 acres).

(2) Swamps around Twilight Creek (c. 10 acres).

(3) Swamps on Mary's Creek (c. 30 acres).

(4) Lake near Ferris Creek (c. 6 acres).

(5) Small lake east of Ferris Creek (c. 6 acres).

(6) Fresh water marshes (non-tidal) on Svensen Island (c. 70 acres).

(7) Small swamps and marshes at Eddy Point (c. 20 acres).

All of these sites are wetlands closely associated with the Columbia River which provide habitat diversity for waterfowl and mammals, and may have some tidal influence.

Management - Suitable designation for these sites is "Conservation Aquatic." Bald Eagle nests near Callander Island and Mary's Creek should be protected.

CLATSOP COUNTY - Site #EC 30 - Goals 17 and 16

(See attached map)

Location - Brownsmead.

Riparian Vegetation - Up to 30' wide zone, where it occurs.

Site Description - Sloughs in Brownsmead, tidegated. These have been identified in the CREST Plan and designated "Conservation Aquatic," which offers adequate protection. These sloughs have variable amounts of riparian vegetation, from none up to a zone 30' wide.

In addition, there is a 40 acre wetland site on Gnat Creek (see attached map), an extension of the Goal 16 and Gnat Creek Marshes, and some associated riparian vegetation (50' wide zone), and also 30' wide riparian zone along Gnat Creek and its tributaries.

Management - The Gnat Creek swamp site should be protected for its natural values; riparian vegetation should be preserved, No change is necessary in the designation of the tidegated sloughs.

CLATSOP COUNTY - Site #EC 31 - Goal 17

(See attached map)

Location - Between Aldrich Point and the western end of Puget Island, riparian vegetation and significant shoreland (upland) areas.

Size - Not measured.

Riparian Vegetation - In this area riparian vegetation extends 50' from the shoreline of the estuary, and on small tributary creeks up to the head of tide. A 301 band of riparian vegetation extends along tributary creeks above the heads of tide.

Along the Columbia River, the riparian zone is extensively interrupted by the Burlington Northern Railroad which mostly follows the estuary shoreline.

Shoreland (upland) resources in this area are: bald eagle nest sites and their protection zones at Aldrich Point; the Bradwood Cliffs old growth area (described by the Nature Conservancy, Site #1). This 40 acre site is one of the last areas of old growth in the County.

Site Description - Bradwood Cliffs - about 40 acres of old growth forest on bluffs by the Columbia River. This site is one of the few remaining tracts of old growth forest in the county and should be preserved. A suitable designation would be "Natural Shoreland."

Management - The riparian zone should be preserved, except where access is required for water-dependent developments. The bald eagle sites should be protected. The Bradwood Cliffs site should be preserved.

CLATSOP COUNTY - Site #EC 34 - Goals 17 and 5

(See attached map)

Location - Tenasillahe Island

Size - About 1,700 acres.

Riparian Vegetation - Some riparian vegetation (up to 30′ wide zone) lines the sloughs.

Site Description - All of the diked portion of Tenasillahe Island is significant under Goal 17 (up to 1,000' from the dike) and Goal 5. Upland areas are critical habitat for the endangered Columbia white-tailed deer, and are actively managed for this species by the USFWS. This area is significant shoreland and biological habitat. The sloughs on the island and some forested swamp areas are significant wetland. These areas, by providing habitat for warm-water fish, for waterfowl, and for other avifauna, enhance the wildlife values of the area. In addition, there are bald eagle nest sites on the eastern side of the island and the protection zones around these are in the significant shorelands area.

Values - Non-tidal freshwater wetlands, warm-water fish, endangered species habitat.

Management - This site should be actively managed to ensure the survival of the white-tailed deer; the wetlands and the bald eagle nest areas should be preserved. Riparian vegetation should be preserved.

CLATSOP COUNTY - Site #EC 35 - Goal 5

(See attached map)

Location - Driscoll Slough marshes, between Wauna Mill and Westport.

Size - About 360 acres.

Vegetation types - Tidal and non-tidal emergent marshes, hackberry swamp, spruce swamp, willow swamp.

Riparian Vegetation - About 3,500 feet along the Columbia River.

Site Description - These tidal swamps, supporting natural climax floodplain vegetation, are one of the last remnants of a vast system of tidal marshes and swamps which once covered many thousands of acres in Columbia County and the eastern end of Clatsop County as far as Bradley Park. The loss of these and similar floodplain areas was a major reason for the decline of the Columbia White-tailed deer. This site has not, however, been identified as critical habitat for the White-tailed deer. In the upper estuary area, in which this site is included, a CREST report notes that 80% of the tidal swamps have been destroyed in the past century. The swamps are laced with tidal sloughs, except for a small area in the NE corner which is cut off from tidal

circulation by fills. These tide channels, fringed by forested swamps, are productive warm-water fish habitat, and are also likely to be important nursery area for juvenile chinook salmon. The area is important to waterfowl and marsh birds, and probably supports breeding populations of mallard and wood duck. This habitat type is of prime importance to aquatic furbearers, such as muskrat, nutria, beaver, river otter, and racoon. Disturbance at this site includes extensive filling for industrial sites and road and railroad causeways.

Management - This site is a good example of an increasingly scarce tidal wetland habitat type. It should be managed to preserve its natural values as forested wetland if possible.

APPENDIX (SHORELINE CHANGES)

During this survey, some areas were identified where shoreline changes to the CREST Plan were needed, because an area had been incorrectly included or excluded from the estuary.

WARRENTON - Site #18 - Goal 16

Location - Middle Skipanon, CREST Plan Subarea 42-05, west bank, south of Harbor Drive Bridge.

Site Description - An area of river bank was incorrectly described as Goal 16 marshes in the CREST Plan. This area should in fact be shorelands. The corrected shoreline is shown on the attached map.

CLATSOP COUNTY - Site #LY 24 - Goal 16

Location - Lewis and Clark River T7N R9W, Section 18.
Youngs River T7N R9W, Section 22.

Vegetation Types - High marsh and swamps.

Site Description - These areas (see map, 1:24,000) occur in the tidal portions of the Lewis and Clark and Youngs Rivers and are effectively undiked. They are therefore covered by Goal 16 and the estuary shoreline should be redrawn to include them.

CLATSOP COUNTY - Site #EC 32 - Goals 16 and 17

(See attached map 1:24,000)

Location - Tidal marshes and swamps east of Aldrich Point on both sides of the road.

Size - About 46 acres.

Vegetation Types - High marsh and willow swamp.

Riparian Vegetation - Approximately 50' x 6,000'.

Soils - Tideland.

Site Description - Columbia River Goal 16 tidal marshes and swamps with a fringe of Goal 17 riparian vegetation. This site was overlooked in the CREST Plan, which calls most of it "shoreland." It probably possesses the usual attributes of high marsh and willow swamp; important habitat for aquatic furbearing mammals and waterfowl. The tide channel probably has some value to fish.

An additional feature of this site is that, despite its being bisected by the railroad, it is one of the few areas in the estuary which show a transition from floodplain marshes and swamps to relatively undisturbed upland forests.

Management - This site should be managed to protect its natural estuarine values: suitable designation would be "Natural Aquatic."

CLATSOP COUNTY - Site #EC 33 - Goal 16

(See attached map 1:24,000)

Location - Hunts Creek Marshes.

Size - About 74 acres.

Vegetation Types - Sitka Willow swamp, spruce swamp.

Riparian Vegetation - None, but riparian vegetation extends above the head of tide on Hunt Creek.

Site Description - The lower reach of Hunt Creek is tidal, and has no tidegate. The tidal section of this creek and its associated swamps are therefore covered by Goal 16. This was apparently overlooked during the CREST Plan since much of this site is not even within the CREST planning area. Likely values of this site are: warm-water fish, may have a small salmon run; waterfowl nesting; important habitat for aquatic furbearers.

Management - This site should be managed as estuarine wetland: a suitable designation would be "Conservation 1, Aquatic."

20 December 1982

MEMORANDUM

Cannon Beach - Elk Creek Wetlands

Visited November 1, 1982 by Duncan Thomas & Rainmar Bartl.

Exact determination of observed wetland boundary is difficult, since no base map was available for the area West of highway 101, and the color 1.4. aerial photo coverage was incomplete.

Photos used in the survey were

COE 77-2341 (B & W)

COE 80-1066 (CIR)

A sketch map of the wetlands on 1" to 400'

Crown Zellerbach maps is attached.

Area 1): Wet of HWY 101, South of elk Creek

These wetlands consist of an area of brackish high marsh adjacent to the sewage lagoon and an area of forested swamp between the sewage lagoon and Elk Creek. These wetlands are linked to Elk Creek by a network of tidal channels. These wetlands all fall under Oregon Statewide Planning Goal 16, as part of the Elk Creek Estuary. The vegetation and drainage system show that these areas would be periodically inundated by tidal water.

Area 2): West of HWY 101, north of Elk Creek

These wetlands are composed of a high marsh area managed as pasture, an area of swamp, separated from the creek by a natural levee and a high marsh island in the creekl. These wetlands technically fall under Goal 16, on account of periodic flooding by tidal water. They are, however, heavily distrubed, and are a very poor example of tidal wetlands.

Area 3): East of HWY 101

This is a large expanse of paldstine spruce and alder swamp, with patches of short and emergent dominated marshes. The wetland exists largely because of

poor drainage characteristics of the site, though there is some tidal influence in the northwest portion. Technically, this area is a complex mix of Goal 16, 17 and 5 wetlands. For convenience, I propose that the tidal portion of Elk Creek should be Goal 16, and the remainder of the mapped area should be covered by Goal 17 and should be designated as a significant wetland.

There is a large area to the south and east of the mapped wetland, which also has poor drainage characteristics. The field survey showed however, that this area did not support extensive wetland vegetation. The herb layer was mostly dominated by Polystichum munitum, a predominantly upland species. The wetlands in this area were found to be not significant.

Soil types at the proposed site vary mainly with elevation and consequently the amount of saturation. Surface soil is generally dark brown silt-loam to a 12- to 15-inch depth. The upper subsoil consists of a dark grayish brown silty clay-loam with predominant gray and red mottles from a 48-inch depth near the higher ground of the creek bank to near ground surface in the lower depressions. The red mottles normally reflect the degree of iron oxidation caused by permanent or nearly permanent water saturation. Soils in the low elevations of the wetlands consist of Brallier or Coquille muck. The soil in the high elevations, mainly along Ecola Creek, probably result from silt deposited during the periodic flooding of the creek.

Prevailing westerly winds and moist air masses from the Pacific Ocean contribute greatly to the weather pattern in Cannon Beach. An average annual rainfall of 77 inches occurs mainly from October through March. Monthly temperatures average 52°F. The warmest months, July, August, and September, have average daily maximum temperatures of 67.1°F, 67.9°F, and 68.3°F, respectively. The coldest month, January, usually produces ten days with temperatures at 32°F or below. For further climatic information, see Facilities Plan Addendum No. 1.

3.2.2 Biological Conditions - Plant and Animal Inventory

The biota and ecology of the Cannon Beach area have been influenced by a variety of factors over time, including soil type, a maritime climate with much rainfall and moderate temperatures, and activities of man.

Mankind has had a profound effect on the establishment of the present plant and wildlife communities in the Cannon Beach area and especially on the study site (as discussed in Section 3.2.1). Initially, much of the present downtown area of Cannon Beach was comprised of wetlands similar to those presently found in the strip of lowland which follows the north bank of Ecola Creek from its mouth to the Highway 101 embankment. Because of their low elevation, these wetlands were flooded by the ocean at high tides, by Ecola Creek during winter runoff and, at times, by both sources at once. In addition, these wetlands received drainage from Ecola Creek as it drained the lower portions of the watershed.

Because long-term changes in water table elevation alter plant communities, it appears the historical flora on the study site, especially in the low areas, was different from those which presently exist. Plants indicative of more xeric (dry) sites in coastal spruce forests such as sword fern, oxalis, and Oregon fairybells (all of which grow on the elevated portions of the sites) were reduced in types and numbers; plants which could grow in more mesic (wet) sites, termed hydrophylic plants, such as skunk cabbage, slough sedge, and lady fern, increased in numbers. Presently, scattered growths of sword fern, salmonberry, hemlock, spruce, mustard and grass occur on tops of hummocks of slough sedge, spruce stumps, and fallen spruce and alder trees.

Ecological succession occurs when one biotic community replaces another. Both plant and animal communities continually change until a more stable climax community is reached. Usually plant succession precedes animal succession as the former is usually the main component of wildlife habitat. With the ascendance of man's activities as a prime component in a particular area's vegetation type, successional patterns frequently do not reach their climax or final state and continually revert to previous stages. The same process occurs in nature as a result of flooding rivers, avalanches, landslides, and forest fires. The yearly flooding of the study site by Ecola Creek probably flushes out much of the organic debris which would otherwise accumulate in the lower portions of the site. This prevents the formation of a humus layer which could support a variety of plants which are less tolerant of saturated soils.

The change of the lowland area from a dry or occasionally wet habitat to a permanently wet habitat has had a profound influence on the vegetative and animal communities which live in the project area.

3.2.2.1 Vegetation

Franklin and Dyrness (1973) consider Cannon Beach to be in the Picea sitchensis (Sitka spruce) Zone which extends along the greater portion of the coastline of Washington and Oregon within a two-to three-kilometer strip. Their descriptions of this zone broadly reflect the plant composition of the site with several exceptions. These authors record western red cedar and devil's club as being major constituents of Sitka spruce forests; only a few very scrubby cedars and no devil's club were found on the project site.

According to the Fish and Wildlife Service wetland classification system (Cowardin, et al., 1979), the entire project area is a palustrine wetland covering four broad classes. The palustrine system includes wetlands dominated by trees, shrubs and/or emergent plants and referred to as swamps, marsh and bog.

Spruce/Elderberry

System:	Palustrine
Class:	Forested wetland
Subclass:	Needle-leaved evergreen/broad-leaved deciduous
Dominance Type:	Picea sitchensis/Sambucus racemosa
Water Regime:	Saturated

Alder/Spruce

System:	Palustrine
Class:	Forest wetland
Subclass:	Broad-leaved deciduous/needle-leaved evergreen
Dominance Type:	Alnus rubra/Picea sitchensis
Water Regime:	Seasonally flooded

Sedge/Alder

System:	Palustrine
Class:	Emergent/forested wetlands
Subclass:	Persistent/broad-leaved deciduous
Dominance Type:	Carex obnupta/AInus rubra
Water Regime:	Semipermanently exposed

Sedge/Twinberry

System:	Palustrine
Class:	Emergent/scrub-shrub wetlands
Subclass:	Persistent/broad-leaved deciduous
Dominance Type:	Carex obrupta/Lonicera involucrata
Water Regime:	Intermittently exposed

A number of plants in Oregon are either listed as endangered species, proposed to be listed as such, or are being watched closely for changes in distribution. A great many of these plants occur on the south side of rocky promontories. Sitka spruce and alder/sedge swamps are not well known habitats for these plants, (Hohn, 1981). No endangered or threatened plants are known to exist on the project site.

The field portion of a vegetation analysis undertaken by a KCM ecologist from May 27 through May 29, 1981 revealed the existence of several different plant communities on the project site (see Figure 2). The plant communities and their associated species are listed in Table 1. Budget restrictions dictated that only one field inventory be conducted. Discussions with the concerned resource agencies led to agreement that the best time for this inventory would be late Spring. Because the field work was conducted in late Spring, a few plants which grow on the project site and bloom at other times of the year were not observed.

TABLE 1
VEGETATION COMMUNITIES
OF CANNON BEACH WETLAND

Blackberry/Alder

Himalayan blackberry	(*Rubus discolor*)
evergreen blackberry	(*Rubus laciniatus*)
red alder	(*Alnus rubra*)
twinberry	(*Lonicera involucrata*)
Sitka spruce	(*Picea sitchensis*)
crab apple	(*Pyrus fusea*)
Scotch broom	(*Cytisus scoparius*)
cow parsnip	(*Heracleum lanatum*)
horsetail	(*Equisetum arvense*)
coltsfoot	(*Petasites frigidus*)
buttercup	(*Ranunculus sp.*)
clover	(*Trifolium sp.*)
slough sedge	(*Carex obnupta*)
soft rush	(*Juncus effusus*)
grass	(Gramineae)
wild mustard	(Cruciferae)
vetch	(*Vida sp.*)

Spruce/Elderberry

Sitka spruce	(*Picea sitchensis*)
red elderberry	(*Sambucus racemosa*)
buttercup	(*Ranunculus sp.*)
red huckleberry	(*Vaccinium parvifolium*)
vine maple	(*Acer circinatum*)
Douglas maple	(*Acer douglasiO*
hemlock	(*Tsuga heterophylla*)
curled dock	(*Rumex crispus*)
wood rush	(*Luzula sp.*)
sword fern	(*Polystichum munitum*)
cow parsnip	(*Reracleum lanatum*)
oxalis	(*Oxalis oregana*)
wild cucumber	(*Marah oreganus*)
montia	(*Montia parvifolid*)
Siberian miner's lettuce	(*Montia siberica*)
bracken	(*Pteriduim aquilinum*)
slough sedge	(*Carex obnupta*)
grass	(Gramineae)
violet	(*Viola spp.*)
crab apple	(*Pyrus fusca*)
foxglove	(*Digitalis purpurea*)
lily of the valley	(*Maianthemum dilatatum*)
tansey ragwort	(*Tanacetum vulgare*)
large-leaf aven	(*Geum macrophyllum*)
common thistle	(*Circium vulgare*)

TABLE 1 (continued)

Spruce/Elderberry (Cont.)

Scouler's corydalis	(*Corydalis scouleri*)
tooth-leaved monkey flower	(*Mimulus dentatus*)
yerba buena	(*Satureja douglesii*)
Oregon fairybells	(*Disporum oregonum*)
woodrush	(*Luzula sp.*)
cascara	(*Rhamnus purshiana*)
evergreen huckleberry	(*Vaccinium ovatum*)

Alder/Spruce

red alder	(*Ainas rubra*)
Sitka spruce	(*Picea sitchensis*)
crab apple	(*Pyrus fusea*)
salmonberry	(*Rubus spectalilis*)
red huckleberry	(*yaccinium parvifolium*)
lily of the valley	(*Maianthemum dilatatum*)
montia	(*Montia parvifolia*)
Siberian miner's lettuce	(*Montia siberica*)
oxalis	(*Oxalis oregana*)
cow parsnip	(*Heracleum lanatum*)
salal	(*Gaultheria shallon*)
slough sedge	(*Carex obnupta*)
bedstraw	(*Galium boreaLe*)
wild cucumber	(*Marah oreganutf*
squashberry	(*Viburnum pauciflorun*
gooseberry	(*Ribes sp*)
tooth-leaved monkey flower	(*Mimulus dentatus*)
hedge nettle	(*Stachys mexicana*)
Fendler's waterleaf	(*tfydrophyllum fendLeri*)
green-tinted heuchera	*Qieuchera chlorantha*)
violet	(*Viola spp.*)
woodrush	(*Luzula sp.*)
wild mustard	(Cruciferae)

Sedge/Alder

slough sedge	(*Carex obnupta*)
red alder	(*Alnus rubra*)
skunk cabbage	(*bysichitum americanum*)
lady fern	(*Athyrium filix-femina*)
water parsley	(*Oenanthe sarmentosa*)
spleenwort	(*Asplenium sp.*)
Pacific cinquefoil	(*Potentilla pacifica*)
narrow-leaf skullcap	(*Scutellaria angustifolia*)
woodrush	***luzula***)
Brewer's bittercress	(*Cardamine breweri*)
angled bittercress	(*Cardamine angula*)

TABLE 1 (continued)

Sedge/Twinberry

slough sedge	*(Carex obnuptd)*
twinberry	*(Lonicera involucrata)*
skunk cabbage	*(Lysichitum americanum)*
water parsley	*(Oenanthe sarmentosa)*
wild mustard	(Cruciferae)
red alder	*(Alnus rubra)*
Sitka spruce	*(Picea sitchensii)*
deadly nightshade	*(Solarium dulcamara)*
maidenhair fern	*(Adiantum pedatum)*
water fern	*(Azollamexicana)*
coast boykinia	*(Boykinia elate)*
American wintercress	*(Barberea orthoceras)*

It is likely the greatest determinant of which plants will predominate on a particular site in the project area is the amount of soil saturation. Some plants which tolerate a wide range of moisture levels and disturbance occur in more than one community. Frequently these plant communities are not clearly delineated, but gradually grade from one to another.

3.2.2.1.1 Blackberry/Alder

The blackberry/aider plant community occupies approximately 15% of the project area, mostly along the dike which supports Highway 101. Because of the slope and higher elevation, the soil does not tend to be saturated during the growing season except in the small ditch which runs along the Highway. Ground cover includes grasses and clover along the drier roadway, slough sedge, horsetail, cow parsnip, and buttercups in the lower ditch. Trailing and evergreen blackberry and twinberry comprise the shrub layer. Young alders, spruce, and crab apple grow on the higher ground east of the small ditch.

3.2.2.1.2 Spruce/Elderberry

The spruce/elderberry association, covering about 20% of the project area, mainly occurs within the southeastern portion of the site along Ecola Creek and on higher ground. It does not appear that this area is as susceptible to winter flooding as the down-creek portion of the site. The spruce trees, some with diameters of over 6 feet, dominate the upper story. Vine maple, crab apple, large red elderberry shrubs, and small hemlock trees provide a middle layer of vegetation. The ground is covered with buttercup, oxalis, sword fern, wild cucumber, and curled dock.

3.2.2.1.3 Alder/Spruce

The alder/spruce plant community covers about 19.0% of the project area along the natural levee adjacent to the creek and in the wetter area west of the spruce/elderberry association. The ground is more susceptible to flooding than that of the spruce/elderberry community. Dry sloughs are much in evidence. Alder is the dominant tree, with spruce scattered throughout the area. Usually the alders on the higher ground are larger, with diameters of one 3c one-half feet or greater. The shrub layer consists of crab apple, salmonberry, and huckleberry. Montia, Siberian miner's lettuce, oxalis, cow parsnip, and slough sedge comprise the herbaceous layer.

3.2.2.1.4 Sedge/Alder

Sedge and small alder trees probably best characterize approximately 11% of the project area between the large slough which contains water throughout the year and runs next to the Highway and Ecola Creek. Because of its elevation and proximity to the large slough, it is relatively well drained, with a matrix of small channels and depressions which usually become dry in the summer.

3.2.2.1.5 Sedge/Twinberry

The sedge/twinberry association occupies the wettest and largest portion of the site on ground, approximately 35% of the project area. The soil in this location probably has one or two feet of water over it most of the year. Numerous large spruce stumps indicate a mature forest once grew throughout this area. In addition, smaller spruce and alder stumps indicate the former presence of a second-growth forest which succumbed not to logging, but to high water tables. Presently a scattering of young alders and spruce grow on hummocks and nurse logs throughout this swamp. Twinberry, growing luxuriantly in this wet habitat, provides a thick shrub layer. Skunk cabbage and

slough sedge dominate the ground cover. Many deep channels and depressions filled with water are evident, along which water parsley grows abundantly.

3.2.2.2 Wildlife

Wildlife, because of its secretive, mobile nature, is harder to observe than plants, and therefore is difficult to analyze in a short ecological survey. Since vegetation and moisture levels are prime components of habitat, the different vegetative communities roughly correspond to habitat types. Because most animals are mobile, they frequently utilize several different habitat types in carrying out life processes. These habitat changes can occur daily and seasonally. Deer remain in thick brush during the day and feed in clearings during the morning and evening hours. Elk usually summer higher up in watersheds and winter at lower elevations where food is more available.

Ecola Creek and its surrounding watershed provide excellent habitat for a very rich and diverse assemblage of wildlife. Many of the animals are listed in Table 2. Large populations of black bear, mink, muskrat, beaver, river otter, raccoon, coyote, and spotted skunks reside along the creek. Although at times quite abundant, the bobcat population has been reduced because of past over-trapping (Teeple, 1981).

Primarily during the winter, a herd of Roosevelt elk, which varies in size, but averages about 18 to 20 animals, wanders over the lower watershed of Ecola Creek, including the project area. During late spring and summer, this herd generally grazes further up the watershed at higher elevations where the cows calve. Elk trails, tracks, and droppings were highly evident on the higher portions of the project site adjacent to the creek. Elk tracks and pellet groups were found in the lower wet areas, but not as frequently nor were they as concentrated. Several elk crossing sites were evident along the creek. Plants which had obviously been grazed included, by order of frequency, sword fern, skunk cabbage, and slough sedge.