

27

ESTUARY

# COLUMBIA RIVER

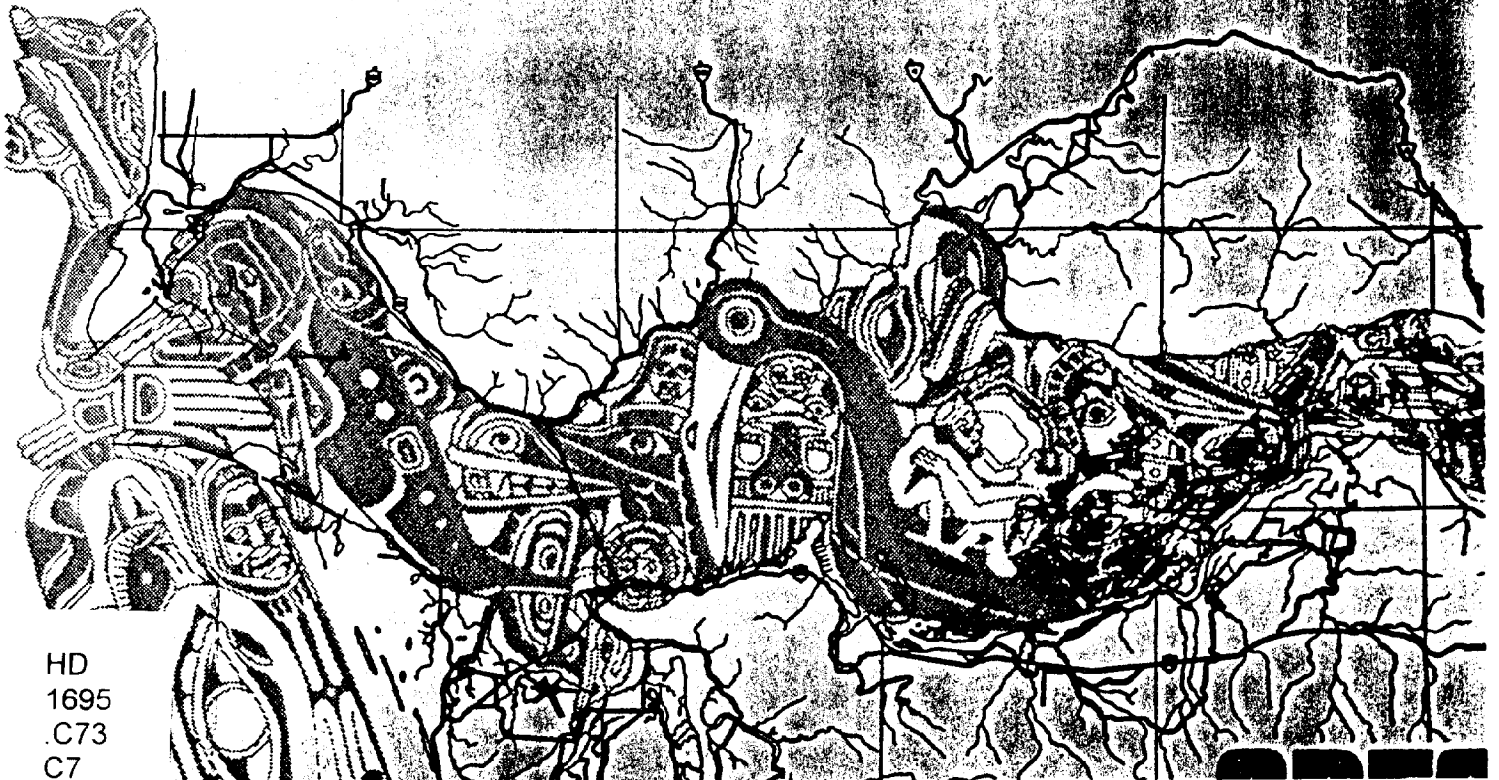
# ESTUARY

STRATEGY FOR WISCONSIN'S COASTAL AND GREAT LAKES

the concept of the Wisconsin Coastal Strategy is to provide a framework for the development of coastal resources and to ensure that the coastal zone is managed in a sustainable manner.

# REGIONAL MANAGEMENT

# PLAN



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COLUMBIA RIVER ESTUARY REGIONAL  
MANAGEMENT PLAN

Revised Edition  
September 1987

U. S. DEPARTMENT OF COMMERCE NOAA  
COASTAL SERVICES CENTER  
2234 SOUTH HOBSON AVENUE  
CHARLESTON, SC 29405-2413

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Preparation of this plan was financially aided through a grant from the National Coastal Resources Research and Development Institute with funds obtained from the National Oceanic and Atmospheric Administration, and appropriated for Section 309 of the Coastal Zone Management Act of 1972.

FD 1695-C73-C7  
1987

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## 1. INTRODUCTION

### 1.1. BACKGROUND

The Columbia River Estuary Regional Management Plan was originally completed in 1979. The Plan was the culmination of 4½ years of planning by the Columbia River Estuary Study Taskforce (CREST), local jurisdictions, state and federal agencies, and concerned citizens. Impetus for developing the Plan came from growing conflicts between conservation, use and development of estuarine areas. The Regional Plan was also in response to state coastal zone management programs and federal funding under the 1972 Coastal Zone Management Act. The need for better management data, for long term protection of critical natural resource areas, and for estuary development all contributed to the planning program.

The 1979 Regional Plan was adopted into local shoreline master programs and comprehensive plans and was implemented through the local zoning and permit process. The plans have been fine-tuned through local plan amendments to meet changing development and conservation needs.

Changes in development needs as well as state and federal regulations and programs became significant enough that in 1987 a revision to the Columbia River Estuary Regional Management Plan was necessary. In addition, the Oregon Department of Land Conservation and Development required that the Plan be updated through their Periodic Review process.

This 1987 revision of the Regional Plan reflects:

Changes in development trends;

Changes in local planning needs;

New or updated state and federal programs and regulations;

New information; and

Language changes to improve and streamline the Plan.

The revision was guided by an agency and citizen advisory committee.

This revised Plan expresses decisions of the CREST Council on estuarine management issues. The Plan has no legal authority except as implemented by local governments in revised Local Comprehensive Plans (Oregon) and amended local Shoreline Management Master Programs (Washington). Also, the decisions in the Plan do not supersede or negate other management and regulatory authorities.

## 1.2. CONTENT AND USE OF THE DOCUMENT

This Plan is intended for use by local jurisdictions in updating their comprehensive plans and shoreline master programs. The Plan also provides citizens and regulatory agencies with regional planning information about the estuary. This Plan should not be used in making local permit decisions or citing local regulations. The local comprehensive plans and shoreline master programs provide this function.

This plan is divided into six sections. Each section's contents are described below.

### Section 1: INTRODUCTION

The introduction provides background on Plan development, explains the use and contents of the Plan, describes the CREST organization, itemizes issues and material addressed in the revision and outlines outstanding planning issues.

### Section 2: MANAGEMENT SYSTEM

This section defines the different land and water use designations used in the Land and Water Use Plan. Designations range from Natural to Development and can be converted into "shoreline environments" for Washington shoreline management programs and "zones" for Oregon local ordinances. The section also lists the development uses and activities allowed in each designation.

### Section 3: DEFINITIONS, POLICIES AND STANDARDS

Section 3 provides the regulatory criteria against which developments are reviewed. It includes definitions that set regulatory limits on uses and activities, development policies and standards, and information on the application of Oregon Impact Assessment/Resource Capability Determinations and the Washington Environmental Checklist.

### Section 4: LAND AND WATER USE PLAN

This section provides land and water use plans for 46 geographic regions of the Columbia River estuary. These regions are called subareas. The plans provide background material on aquatic and shoreland physical and biological characteristics, human use and planning issues in each subarea. Each plan establishes and maps water use designations for the subarea. Area-specific policies about resources that need special protection or how development should proceed are also included here.

## Section 5: CUMULATIVE IMPACTS

Section 5 describes cumulative development impacts that are expected and that have occurred since major development began on the estuary.

## Section 6: PLAN IMPLEMENTATION

The implementation section describes how local, state, and federal agencies can use the Plan. The section details local jurisdictional adoption of the Plan, the local permit process, and Plan amendment process. Federal consistency issues are also described.

The six Plan sections are followed by appendices, including:

Appendix A: CREST Charter

Appendix B: Goal Exceptions

Appendix B summarizes exceptions to Oregon Statewide Planning Goals that affect the estuary area.

Appendix C: Documents Incorporated into the Plan by Reference.

Appendix C lists the documents incorporated into the Plan by reference. These documents contain planning and regulatory information that is considered part of this Plan.

Appendix D: Bibliography

The Bibliography cites all of the documents used in the revision of this Plan.

Appendix E: Meeting Attendants and Plan Commentors

Appendix E lists the citizens and agency personnel that attended the CREST Plan Revision Advisory Committee meetings or provided comments on the revised Plan.

Two elements of the Regional Management Plan are published under separate covers. These are the Columbia River Estuary Dredged Material Management Plan and the Mitigation and Restoration Plan for the Columbia River Estuary.

### 1.3. CREST ORGANIZATION

The Columbia River Estuary Study Taskforce was established in 1975 under the authority of ORS 190 (Oregon Intergovernmental Coordination Act) and RCW 34.39 (Washington Interlocal Cooperation Act). A Charter and Agreement was developed (Appendix A) and local governments joined in the effort. CREST members now include:



Washington:

Port of Ilwaco  
Town of Ilwaco  
Pacific County  
Wahkiakum Port District #2

Oregon:

City of Astoria  
Port of Astoria  
Clatsop County  
Town of Hammond  
City of Warrenton

The CREST Council, made up of representatives from each local government, is the policy and decision-making body for the organization. The CREST staff is responsible to the Council for all CREST planning and implementation functions. The staff consists of personnel with experience in land-use planning, estuarine and wetland ecology, oceanography, estuarine development, and economics.

CREST's funding is derived primarily from federal monies provided under Sections 306 and 309 of the Coastal Zone Management Act, and dues from local member jurisdictions. Other federal, state, local, or private organizations occasionally provide funding for special planning or implementation projects.

CREST's primary role is to provide land and water use planning assistance to local jurisdictions. This planning work includes:

- Reviewing and providing recommendations for development permits;
- Drafting Plan amendments;
- Assisting developers in fulfilling permit requirements;
- Drafting plans to address specific local planning needs;
- Updating local planning documents to meet changing local needs and state and federal requirements.

In addition to the central planning role, CREST also provides the following services to member jurisdictions:

- Developing grant applications for port or community projects;
- Assisting members in applying for and obtaining local, state, and federal permits for development projects.
- Maintaining a library with materials on land use, regulations, and resources in the lower Columbia River.
- Providing a forum for discussion and resolution of regional issues

on the Columbia River Estuary.

CREST helps to facilitate orderly development in the Columbia River Estuary while ensuring the protection and conservation of the estuary's natural resources. CREST's goals are:

- To improve and diversify the economy of the area;
- To reconcile conflicting uses of estuarine resources;
- To protect and enhance natural resource values of the estuary;
- To improve estuarine resource management through intergovernmental communication and coordination at local, state, and federal levels;
- To increase public understanding of the natural value of the estuary and its usefulness to people; and
- To increase knowledge of the biological, physical, and socio-economic characteristics of the estuary.

#### 1.4. ISSUES AND INFORMATION ADDRESSED IN THE PLAN REVISION

This revision to the Regional Management Plan focuses on needs and information which have changed or arisen since the completion of the original Plan in 1979. Items addressed in the revision include changes in development and planning trends and needs, new programs, regulations, and information, and Plan streamlining and language improvements. Issues and information addressed in the revision are listed below.

##### 1.4.1. Changes in Development Trends

Estuary development trends have changed since the original Plan was completed in 1979. The following changes are addressed in the revised Plan:

- Loss of rail service: The rail line west of Astoria was abandoned in 1985. The revised Plan examined the affects of railroad abandonment on industrial sites.
- Youngs Bay gillnet fishery: Since 1979 a gillnet fishery has developed in Youngs Bay.
- Mitigation bank: A mitigation bank was created near the airport in 1986.
- Toxic waste site: Toxic wastes were discovered at a site on the south Astoria waterfront in 1984.
- Ownership changes and development at Tansy Point: Since the

completion of the Plan in 1979, ownership of the Tansy Point industrial site has been consolidated under the City of Warrenton. A wood products facility occupies much of the site.

- Port development trends: Since 1979, the Port of Astoria has experienced a shift from wet-log to dry-log loading, has torn down their grain elevator, has undertaken other developments, and has developed a new long range plan. The revised Plan reflects these changes.
- Tourism: There has been an increase in planning for and marketing the area for tourism. The revised Plan incorporates tourist-related plans that have been developed since 1979.

#### 1.4.2. Changes in Local Planning Needs

Since the completion of the Plan in 1979, several planning issues have arisen that required additions or changes to the Plan. These issues, along with some items that were not addressed in the original Plan, include:

- 1981 CREST Mediation Panel Agreement: The revised Plan incorporates the results of this Agreement.
- Water quality: The revised Plan provides updated water quality policies.
- Aquaculture: Aquaculture policies have been updated to reflect new state regulations.
- Gillnet drift protection: The updated Plan provides more complete gillnet drift protection policies.
- Federal consistency: The Plan implementation section explains federal consistency procedures based on refinement of state procedures for reviewing consistency.
- Dredged Material Management Plan update: The 1986 update of the Dredged Material Management Plan is incorporated into this Plan.
- Mitigation Plan update: The 1987 update of the Mitigation Plan is incorporated into this Plan.
- Public Access: The revised Plan includes more information on public access and revises public access policies based on Oregon statutory changes.
- State Environmental Policy Act: The revised Plan presents environmental checklist procedures in the Plan implementation section.

#### 1.4.3. New or Updated State and Federal Programs and Regulations

The revised Plan addresses the following statutes, regulations and programs that have been developed or updated since 1979.

- Oregon Periodic Review Requirements.
- Revisions to Oregon Statewide Planning Goals 16 and 17.
- Revisions to Washington Shoreline Management Act.
- Oregon Division of State Lands Mitigation Administrative Rule.
- U. S. Fish and Wildlife Service Mitigation Rules.
- New Corps of Engineers Rules for regulating and identifying wetlands.
- New sediment testing requirements based on the Puget Sound Dredge Disposal Analysis Program and Environmental Protection Agency regulations.
- Changes in energy facility siting review.

#### 1.4.4. New Information

The revised Plan addresses planning, socio-economic, and natural resource information that has been developed since 1979. These are listed below. Appendix D, Bibliography, contains complete citations.

- CREST Mediation Panel Agreement.
- Port of Astoria Marine Terminals Development Plan.
- Port of Ilwaco Comprehensive Marine Plan.
- Astoria Waterfront Revitalization Plan.
- Skamokawa Waterfront Plan.
- Lower Columbia River Assessment of Oregon Deep Draft Sites
- Oregon Port Assessment.
- Ports and Transportation Systems Study (Washington).
- Area D Disposal Studies.
- Aquaculture Siting Study.
- Columbia River Estuary Data Development Program Reports (20 reports and 2 atlases).

- Bald Eagle Study.
- Crab Environment Studies.
- Significant shoreland and wetland habitats in the Clatsop Plains and the Columbia Floodplain of Clatsop County.

#### 1.4.5. Plan Language Improvement and Streamlining

Several additional improvements were made to the Plan during the revision process. These include the following:

- The Plan is shorter.
- Repetition among Plan policies has been reduced.
- Ambiguous policy language has been clarified.
- Plan language and subsection format is more internally consistent.
- The Plan now specifies policy differences between Oregon and Washington.
- The subarea maps have been redrafted on a new, more accurate base map. The maps are presented in a more readable format than the original plan.

#### 1.5. OUTSTANDING PLANNING PROBLEMS, ISSUES AND NEEDS

Several planning problems, issues, and needs were not addressed by this revision of the Regional Management Plan because they were beyond the scope of the Plan revision. CREST will endeavor to address these issues and needs. Important outstanding issues recognized during the Plan revision process that could not be addressed fully by the Plan are summarized below.

##### 1.5.1. Wetland Regulation

State and federal wetland regulation has become increasingly vigorous in the past five years. Although CREST and local wetland policy is consistent with these regulations for estuarine wetlands, inconsistencies for the regulation of nontidal wetlands remain. These nontidal wetlands cover large portions of the estuary and tributary river floodplains.

Regulatory inconsistencies in nontidal wetland areas make long-range planning difficult and significantly reduce regulatory predictability. Wetland developments can now receive local permit approval but

permit denial or violation allegations at the state and federal level. Because existing long-range plans do not address these wetland areas, it is difficult to implement local development regulations and to plan developments.

A long-range management plan for the nontidal wetland areas is needed. The plan would need to accurately inventory nontidal wetlands and establish development and conservation policy consistent with current state and federal regulations. The plan could be implemented through the Corps of Engineers general permit program.

#### 1.5.2. Mediation Panel Agreement

In 1981 CREST sponsored a series of mediated negotiation sessions among local governments, developers, and resource agencies to establish development limits at five water-dependent development sites. The interagency agreement that resulted from the sessions is referred to as the Mediation Panel Agreement.

Since 1981, there has been some disagreement on the application of the Mediation Panel Agreement regulations. Some parties to the Agreement contend that developments are limited only to those specifically mentioned in the Agreement while other contend that the Agreement sets general outer bounds for development but does not restrict type of water-dependent development. Some agencies have unofficially requested renegotiation of the Agreement. This Plan revision uses the designations and at policies established in the Mediation Panel Agreement.

A set of rules for interpreting and applying the Mediation Agreement needs to be established and agreed to by all parties of the Agreement. Renegotiation will be pursued only if desired by all parties to the Agreement.

#### 1.5.3. East Astoria Port Development Site

The 1986 Lower Columbia River Assessment of Oregon Deep Draft Sites identified a potential port development site in east Astoria adjacent to the Alderbrook area. This site has not been considered in the past.

Development of the site would require about 170 acres of fill in a Conservation Aquatic designated area. The development would be adjacent to a quiet residential neighborhood. Local residents and the City of Astoria have objected to designating the site. The Oregon Department of Economic Development and Division of State Lands state that the site is needed for the States overall port development strategy and want it designated so in the Plan.

This revised Plan does not designate the port site and retains the Conservation Aquatic designation in the area. This decision is based on local objections to the designation, the need for an exception to

Oregon Statewide Planning Goal 16 to designate the site, natural values in the aquatic area, the lack of citizen and agency participation in the selection of the site and the lack of adequate compensatory mitigation sites for a fill of this magnitude. Redesignation of the area as a port site will only be considered after full agency and citizen participation and the redesignation has been justified through the goal exception process.

#### 1.5.4. Oil and Hazardous Waste Spill Planning

The Plan revision does not contain adequate policies or fully address contingencies for oil and hazardous waste spills in the estuary. The Oregon Department of Environmental Quality and Washington Department of Ecology are the primary planning agencies for spills. An up-to-date oil and hazardous waste plan needs to be developed and reflected in the local comprehensive plans and shoreline master programs.

#### 1.5.5. Outer Continental Shelf Development

Areas off the Oregon and Washington coasts are scheduled for oil and mineral exploration and development leasing in the early 1990's. Although the Regional Management Plan does not regulate offshore development, it should address impacts to the estuary region resulting from the impacts. The plan needs to provide for support facilities, construction sites, and staging areas for offshore exploration and development. In addition, socio-economic affects of the development need to be addressed.

#### 1.5.6. Dike Maintenance

Regulation of dike maintenance activities is a major issue in the estuary. The Regional Management Plan allows for maintaining dikes with trucked-in material and with material dredged from subtidal aquatic areas. This is consistent with state and federal policy. About one-third of the dikes in the estuary cannot be accessed by trucks or barge-mounted dredging equipment. Unless some other alternative is found, these dikes can only be maintained with material removed from intertidal marshes and flats fronting the dikes.

Resolution of this issue requires a thorough alternatives analysis for dike maintenance and, in Oregon jurisdictions, an exception to Oregon Statewide Planning Goal 16.

#### 1.5.7. Marina Planning

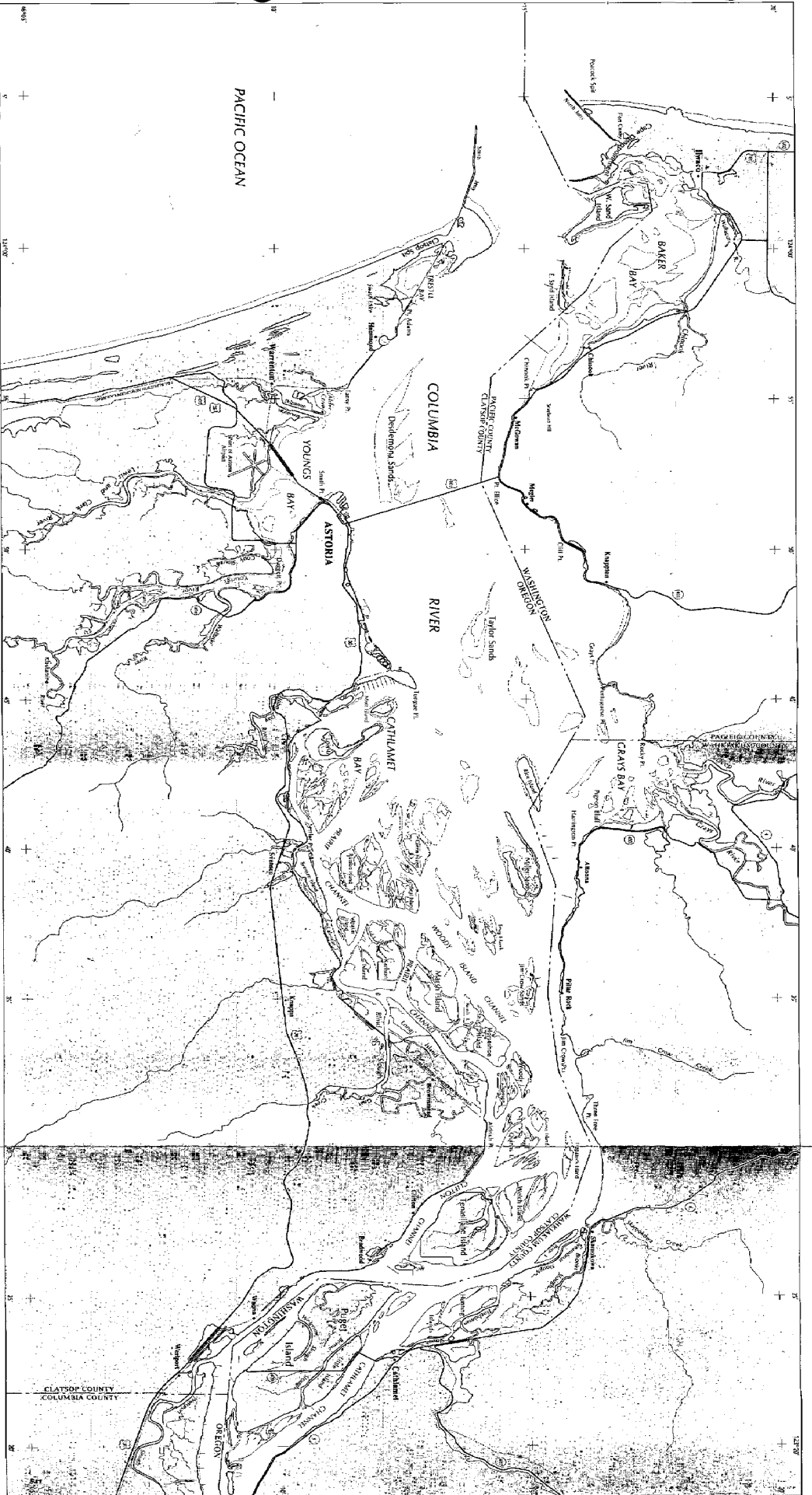
The revised Regional Management Plan does not thoroughly address

marina expansion and development needs. Planning for these needs must be based on a marina demand analysis. A marina analysis was completed in 1978 when the estuary's marinas were filled to capacity. Demand subsequently declined in the early 1980's but is now increasing. The 1978 study is too outdated to be of use for planning purposes. A new analysis of marina demand is needed before the plan can fully address current needs of the estuary's marinas.

#### 1.5.8. Aquaculture

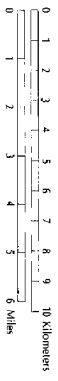
Aquaculture activities are increasing in the estuary and throughout the Northwest. The revised Plan contains updated aquaculture policies. However, because the aquaculture potential of the estuary has not been studied, the Plan could not make provisions for aquaculture sites and special needs.





# Columbia River Estuary

Scale 1:160,000



Map produced in 1983 by Northwest Cartography, Inc.  
for the Columbia River Estuary Data Development Program

- Shoreline (limit of non-aquatic vegetation)
- Intertidal vegetation
- Shoals and flats
- Lakes, rivers, other non-tidal water features
- Major highways
- Cities, towns
- Railroads
- Other cultural features

## 2. MANAGEMENT SYSTEM

### 2.1. INTRODUCTION

The Columbia River Estuary Regional Management Plan's Management System consists of nine aquatic and shoreland designations, and a corresponding list of permitted uses and activities for each designation. The nine designations are:

Natural Aquatic;  
 Conservation Aquatic;  
 Development Aquatic;  
 Rural Aquatic;  
 Development Shoreland;  
 Conservation Shoreland;  
 Natural Shoreland;  
 Rural Shorelands; and  
 Water-Dependent Development Shorelands.

These designations are analogous to the shoreline environments designations established under the Washington Shoreline Management Act, and used by CREST's Washington members in their Shoreline Management Master programs. They are also analogous to the Oregon estuary and shoreland management units established under Statewide Planning Goals 16 and 17, and used by CREST's Oregon jurisdictions in their comprehensive plans and zoning ordinances.

The Conservation designation is also referred to as a Conservancy Environment in Washington. The Development designation is known as Urban in Wahkiakum County. None of the jurisdictions use all of these designations. Table 2-1 describes the designations that are applicable in each jurisdiction.

TABLE 2-1

#### AQUATIC AND SHORELAND DESIGNATIONS

Jurisdiction	<u>Aquatic Designations</u>				<u>Shoreland Designations</u>				
	NA	CA	RA	DA	NS	CS	RS	DS	WDDS
Astoria	X	X		X	X	X		X	X
Cathlamet				X				X	
Hammond		X		X		X		X	X
Ilwaco	X	X		X				X	
Warrenton	X	X		X		X	X	X	X
Clatsop County	X	X		X	X	X	X		X

TABLE 2-1 cont.

AQUATIC AND SHORELAND DESIGNATIONS

Jurisdiction	<u>Aquatic Designations</u>				<u>Shoreland Designations</u>				
	NA	CA	RA	DA	NS	CS	RS	DS	WDDS
Pacific County	X	X		X	X	X	X	X	X
Wahkiakum County	X	X	X	X	X	X	X	X	

The use and activity lists associated with each designation, and the designation's purpose statement, are derived from Washington Shoreline Management Act Rules (WAC 173-14 to 173-22) and from Oregon State-wide Planning Goals 16 and 17.

Aquatic designations cover the entire estuary below the landward limit of aquatic vegetation or, where aquatic vegetation is not present, Mean Higher High Water. Shoreland designations cover land areas and nontidal wetlands along the estuary shoreline. The landward extent of shoreland designations is described in subarea plans in Section 4.

2.2. AQUATIC AND SHORELAND DESIGNATIONS

This section summarizes information on the types of uses and activities that may be permitted in the different aquatic and shoreland designations. This information is presented in the form of nine lists, each corresponding to a different designation. The lists are exclusive: uses and activities omitted from a list are not permitted in that designation. Notations on the lists indicate additional substantive and procedural requirements associated with particular uses. These additional requirements are described in Subsection 3.4. Many of the terms appearing on the use lists have specific regulatory definitions. These terms are defined in Subsection 3.2. Uses and activities on the list may only be approved if they comply with applicable Regional Policies and Standards (subsection 3.3.) and applicable Subarea Policies (section 4.).

2.3. DESIGNATION/USE LISTS

2.3.1. Natural Aquatic

Natural Aquatic areas are designated to assure the protection of significant fish and wildlife habitats; of continued biological productivity within the estuary; and of scientific, research, and educational needs. These areas are managed to preserve natural resources in recognition of dynamic, natural, geological, and evolutionary processes.

Natural Aquatic areas include all major tidal marshes, tideflats, and seagrass and algae beds. The designation is intended to preserve those aquatic natural resource systems existing relatively free of human influence.

\* Resource Capability Determination and Impact Assessment Required.

1. Undeveloped low-intensity, water-dependent recreation.
2. Research and educational observation.
3. Navigation aids, such as beacons and buoys.
4. Protection of habitat, nutrient, fish, wildlife and aesthetic resources.
5. Passive restoration measures.
6. Estuarine enhancement. \*
7. Maintenance and repair of structures existing as of 10/7/77 or structures that are allowed in the Natural Aquatic designation.
8. Bridge crossings.
9. Vegetative shoreline stabilization.
10. Riprap for protection of: uses existing as of October 7, 1977; unique natural resources; historical and archeological values; public facilities;
11. Bridge crossing support structures and dredging necessary for their installation or maintenance. \*
12. Tidegate installation and maintenance in functional dikes, including necessary dredging. \*
13. Active restoration of fish habitat, wildlife habitat, or water quality. \*
14. Aquaculture which does not involve dredge or fill or other estuarine alteration other than incidental dredging for harvest of benthic species or removable in-water structures such as stakes or racks. \*
15. Communication facilities. \*
16. Pipelines, cables and utility crossings, including incidental dredging necessary for their installation. \*
17. Boat ramps for public use where no dredging or fill is needed. \*

18. Temporary alterations. \*

A use which requires dredging, fill, in-water structures, riprap, log storage, water intake, flowlane disposal of dredged material, or other activities which could affect the estuary's physical processes or biological resources are subject to an Impact Assessment, pursuant to Subsection 3.4.1.

2.3.2. Conservation Aquatic

Conservation Aquatic areas are designated for long-term uses of renewable resources that do not require major alterations of the estuary, except for the purpose of restoration. They are managed for the protection and conservation of the resources found in these areas. The Conservation Aquatic designation includes areas needed for the maintenance and enhancement of biological productivity, recreational resources, aesthetic features and aquaculture. The Conservation Aquatic designation includes areas that are smaller or of less biological importance than Natural Aquatic areas. Areas that are partially altered and adjacent to existing moderate intensity development which do not possess the resource characteristics of other aquatic areas are also included in this designation.

\* Resource Capability Determination and Impact Assessment Required.

1. Undeveloped low-intensity, water-dependent recreation.
2. Research and educational observation.
3. Navigation aids, such as beacons and buoys.
4. Estuarine enhancement.
5. Protection of habitat, nutrient, fish, wildlife and aesthetic resources.
6. Passive restoration measures.
7. Active restoration of fish habitat, wildlife habitat, or water quality.
8. Communication Facilities.
9. Pipelines, cables and utility crossings, including incidental dredging necessary for their installation.
10. Vegetative shoreline stabilization.
11. Bridge Crossings.
12. Aquaculture which does not involve dredge or fill or other estuarine alternation other than incidental dredging for

harvest of benthic species or removable in-water structures such as stakes or racks.

13. Boat ramps for public use where no dredging or fill is needed.
14. Beach nourishment at a designated site.
15. Maintenance and repair of structures existing as of 10/7/77 or structures that are allowed in the Conservation Aquatic designation.
16. Bridge crossing support structures and dredging necessary for their installation or maintenance.
17. Structural shoreline stabilization for protection of uses existing as October 7, 1977; unique natural resources; historical and archeological values; public facilities; uses allowed in this designation; or uses allowed on adjacent shorelands.
18. Tidegate installation and maintenance in existing functional dikes, including necessary dredging.
19. Active restoration for purposes other than protection of habitat, nutrient, fish, wildlife and aesthetic resources. \*
20. Aquaculture requiring dredge or fill or other alteration of the estuary. \*
21. High-intensity water-dependent recreation, including boat ramps, marinas and individual docks, and new dredging for these uses. \*
22. Minor navigational improvements. \*
23. Mining and mineral extraction. \*
24. Other water-dependent uses requiring occupation of water surface area by means other than dredge or fill. \*
25. Temporary alterations. \*
26. Dredging to obtain material for dike maintenance pursuant to the dike maintenance dredging standards in Subsection 3.3.4. \*

A use which requires dredging, fill, in-water structures, riprap, log storage, water intake, flowlane disposal of dredged material, or other activities which could affect the estuary's physical processes or biological resources must be subject to an Impact Assessment, pursuant to Subsection 3.4.1.

### 2.3.3 Rural Aquatic

Rural Aquatic areas are designated to protect areas of the estuary for recreational and open-space uses. These areas serve as a buffer between aquatic areas in a Development designation, and aquatic areas in Conservation of Natural designations.

1. Recreation
2. Navigation Aids
3. Docks and Moorages
4. Signs
5. Log Storage
6. Aquaculture
7. Scientific Research and Education
8. Vegetative Shoreline Stabilization
9. Structural Shoreline Stabilization (Riprap)
10. Repair and Maintenance of Existing Dikes
11. Dredging
12. Residential Use\*
13. Commercial Use\*
14. Industrial and Port Facilities\*
15. Utilities\*
16. Marinas\*
17. Navigation Structures\*
18. Forest Practices\*
19. Log Dump/Log Sort Area\*
20. Mining/Mineral Extraction\*
21. Bulkheads\*
22. New Dikes\*
23. Fill\*
24. Dredged Material Disposal\*
25. Bankline or Stream Alteration\*

\*These uses may only be approved as a Conditional Use.

#### 2.3.4 Development Aquatic

Development Aquatic areas are designated to provide for navigation and other identified needs for public, commercial, and industrial water-dependent uses. The objective of the Development Aquatic designation is to ensure optimum utilization of appropriate aquatic areas by providing for intensive development. Such areas include deep-water adjacent to or near the shoreline, navigation channels, subtidal areas for in-water disposal of dredged material, areas of minimal biological significance needed for uses requiring alteration of the estuary, and areas that are not in Conservation or Natural designations.

\* Must be consistent with Development Aquatic purpose, and consistent with adjacent Shorelands Designation purpose.

1. Navigation.
2. Water-dependent commercial, industrial and port uses, including but not limited to the water-dependent portions of the following uses:
  - a. Docks, moorages, piers or wharves;
  - b. Fuel storage or dispensing facilities;
  - c. Cargo loading or unloading facilities;
  - d. Vessel maintenance or repair facilities;
  - e. Seafood receiving, processing or storage;
  - f. Cargo marshalling, assembly and storage facilities;
  - g. Ice making and sales establishments;
  - h. Integrated manufacturing and shipping facility where a significant portion of the operation is water-dependent;
  - i. Commercial aquaculture production facilities.
3. High intensity water-dependent recreation.
4. Maintenance and repair of existing structures.
5. Water transport channels where dredging may be necessary.
6. Flowlane disposal of dredged material.
7. Water storage areas where needed for products used in or resulting from industry, commerce, and recreation.



8. Navigational structures.
9. Boat ramps. \*
10. Undeveloped low-intensity, water-dependent recreation. \*
11. Water-related uses, including but not limited to: \*
  - a. Administrative offices of water-dependent business or agencies;
  - b. Marine hardware sales and repair;
  - c. Charter fishing offices;
  - d. Net storage.
12. Non-dependent, non-related uses not requiring dredge or fill.\*
13. Research and educational observations. \*
14. Navigation aids, such as beacons and buoys. \*
15. Minor navigational improvements. \*
16. Protection of habitat, nutrient, fish, wildlife and aesthetic resources. \*
17. Passive restoration. \*
18. Active restoration. \*
19. Bridge crossings. \*
20. Aquaculture. \*
21. Communication facilities. \*
22. Pipelines, cables and utility crossings, including incidental dredging necessary for their installation. \*
23. Installation of new tidegates in existing functional dikes. \*
24. Temporary alterations. \*
25. Mining and mineral extraction. \*
26. Structural shoreline stabilization. \*
27. Bridge crossing support structures and dredging necessary for their installation. \*

A use which requires dredging, fill, in-water structures, riprap, log storage, water intake, flowlane disposal of dredged material, or

other activities which could affect the estuary's physical processes or biological resources must be subject to an Impact Assessment, pursuant to Subsection 3.4.1.

#### 2.3.5. Natural Shoreland

Natural Shoreland areas are designated to assure protection of significant nontidal marshes, significant shoreland wildlife habitat, and exceptional aesthetic resources. Natural Shorelands are managed for low-intensity recreation, wildlife habitat management and other non-consumptive uses.

1. Timber harvesting and propagation.
2. Grazing of livestock.
3. Low-intensity recreation.
4. Navigation aides, such as range markers.
5. Research and educational observation.
6. Vegetative shoreline stabilization.
7. Pipelines, cables, and utility crossings.
8. Mitigation and restoration, where consistent with the maintenance of natural values.
9. Public access improvement projects as specified in public access plans, where consistent with the maintenance of natural values.
10. Repair and maintenance of existing structures.
11. Structural shoreline stabilization for protection of: uses existing as of 10/7/77; unique natural resources; historical and archeological values, and public facilities; or uses allowed in this designation.

#### 2.3.6. Conservation Shoreland

Conservation Shoreland areas are designated for long-term uses of renewable resources where shoreland resources lack the significance of those included in the Natural Shorelands designation. Aquaculture, agriculture, forestry, and recreation are the primary uses.

\* Must be consistent with the purpose of the Conservation Shorelands designation.

1. Low-intensity recreation.

2. Navigation aides, such as range markers.
3. Utilities.
4. Agriculture.
5. Timber propagation and harvest.
6. Public access improvement projects as specified in public access plans.
7. Communication facilities.
8. Repair and maintenance of existing structures.
9. Temporary alterations.
10. Structural shoreline stabilization for protection of: uses existing as of 10/7/77; unique natural resources; historical and archeological values; public facilities; uses allowed in this designation; or uses allowed in adjacent shoreland designations.
11. Dredged material disposal. \*
12. Aquaculture facilities. \*
13. Beach nourishment at a designated site.
14. Mitigation and restoration.
15. Log storage and sorting yard.
16. Single-family dwelling.
17. Land transportation facilities.
18. Dikes and tidegates.
19. Excavation to create new water surface area, for purposes other than mitigation.
20. Water-dependent recreation.
21. Marine research and education facilities.
22. Dock or moorage facilities.

#### 2.3.7. Rural Shoreland

Rural Shoreland areas are designated to protect agricultural land from urban expansion; to restrict development along undeveloped

shorelines; to function as a buffer between urban areas; and to maintain open spaces and opportunities for recreational uses. Shorelands in the Rural Shoreland designation include agricultural and recreational areas, low density residential areas and areas where public facilities are generally not fully available.

\* Unless proposed for areas built upon or committed to non-resource uses, there uses may be approved only upon a finding that the use satisfies a need which cannot be accommodated on uplands or in urban and urbanizable areas or in rural residential areas (Clatsop County only).

1. Farm uses.
2. Timber propagation and harvesting.
3. Water-dependent recreation.
4. Aquaculture.
5. Dredged material disposal.
6. Public access improvement projects, as specified in public access plans.
7. Navigation aides, such as range markers.
8. Beach nourishment at a designated site.
9. Maintenance and repair of existing structures.
10. Structural shoreline stabilization for protection of: uses existing as of 10/7/77; unique natural resources; historical and archeological values; public facilities; uses allowed in this designation; or uses allowed in adjacent shoreland designations.
11. Vegetative shoreline stabilization.
12. Dikes and tidegates.
13. Land transportation facilities.
14. Low-intensity recreation.
15. Single-family residences, including mobile homes.
16. Water-dependent commercial uses. \*
17. Water-dependent industrial uses. \*
18. Other water-related uses. \*
19. Non-dependent, non-related uses. \*

### 2.3.8. Development Shoreland

Development Shoreland areas are designated to provide for water-related and water-dependent development along the estuary's shoreline. Development Shoreland areas include urban or developed shorelands with little or no natural resource value, and shorelands with existing water-dependent or water-related uses.

1. Water-dependent recreation.
2. Water-dependent commercial uses.
3. Water-dependent industrial uses.
4. Shoreland aquaculture support facilities.
5. Navigation aides, such as range markers.
6. Port facilities.
7. Structural shoreline stabilization.
8. Repair and maintenance of existing structures.
9. Utilities.
10. Dikes and tidegates.
11. Marine research and education facility.
12. Excavation to create new water surface area, other than for mitigation.
13. Mitigation and restoration.
14. Temporary uses.
15. Dredged material disposal.
16. Public access improvement projects, as specified in public access plans.
17. Water-related uses.
18. Non-dependent, non-related uses.
19. Single and multi-family residences, including mobile homes.
20. Vegetative shoreline stabilization.
21. Storm water and treated wastewater outfall.
22. Communication facilities.

23. Off-street parking.

24. Land transportation facilities.

#### 2.3.9. Water-Dependent Development Shoreland.

Water-Dependent Development Shoreland areas have unique characteristics that make them especially suited for water-dependent development. These areas are managed for water-dependent recreational, commercial and industrial uses.

\* May be approved only upon a demonstration that it will not preempt water-dependent uses.

1. Water-dependent recreation.
2. Water-dependent commercial uses.
3. Water-dependent industrial and port uses.
4. Temporary uses involving an existing structure.
5. Shoreland aquaculture support facilities.
6. Navigation aides, such as range markers.
7. Port facilities.
8. Structural shoreline stabilization.
9. Repair and maintenance of existing structures.
10. Utilities.
11. Dikes and tidegates.
12. Marine research and education facility.
13. Excavation to create new water surface area, other than for mitigation.
14. Mitigation and restoration. \*
15. Dredged material disposal.
16. Public access improvement projects, as specified in public access plans. \*
17. Water-related uses. \*
18. Vegetative shoreline stabilization. \*

19. Storm water and treated wastewater outfall. \*
20. Communication facilities. \*
21. Off-street parking, limited to on-site need. \*
22. Land transportation facilities. \*

### 3. DEFINITIONS, POLICIES, AND STANDARDS

#### 3.1. INTRODUCTION

Regional Policies and Standards are included in this section, along with environmental assessment procedures, and regulatory definitions of key terms.

The Policies and Standards (subsection 3.3.) are regionally applicable to uses and activities occurring in Columbia River Estuary aquatic areas and shorelands. They establish both land use and environmental protection regulations. The Policies establish broad goals and objectives, while the Standards set more specific implementing measures. The Policies and Standards are divided into twenty-one different subject areas covering the full range of developments and resources on the Columbia River Estuary. Additional area-specific policies are found in the subarea plans, Section 4.

The Definitions (subsection 3.2.) establish specific regulatory meanings for about 70 different terms and phrases used in this Plan. Many of the definitions are derived from the Washington Shoreline Management Act and its administrative rules, and from the Oregon State-wide Planning Goals.

The Environmental Assessment material (subsection 3.4.) establishes separate procedures for evaluating the environmental impacts of projects in Oregon and Washington jurisdictions. The Oregon jurisdiction Impact Assessment and Resource Capability Determination is derived from State-wide Planning Goal 16. The Washington jurisdiction Environmental Checklist is derived from the State Environmental Policy Act (WAC 197-11).

#### 3.2. DEFINITIONS

**ABUTMENT:** A substructure composed of stone, concrete, brick or timber supporting the end of a single span bridge or the ends of a multispan superstructure and, in general, retaining or supporting the approach embankment placed in contact therewith.

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

**AGITATION DREDGING:** Dredging by displacement of sediments out of a shoaled area using currents generated by a ship's propeller or large pump. Also referred to as propwash dredging and sandwave skimming, depending on the gear and techniques used.

**AQUACULTURE:** The raising, feeding, planting and harvesting of fish, shellfish, aquatic plants, or other aquatic organisms, including associated facilities necessary to engage in the use.



**AQUATIC AREA:** In the Columbia River Estuary, the tidal waters and wetlands, and the land underlying these waters. The upper limit of aquatic areas is the upper limit of aquatic vegetation or, where vegetation does not exist, Mean Higher High Water.

**AVULSION:** A tearing away or separation by the force of water. Land which is separated from uplands or adjacent properties by the action of a stream or river cutting through the land to form a new stream bed.

**BANKLINE ALTERATION:** Realignment of a stream bank or the entire stream, either within or outside of its normal high water boundaries.

**BEACH:** Gently sloping areas of loose material (e.g., sand, gravel, and cobbles) that extend landward from the low-water line to a point where there is a definite change in the material type or landform, or to the line of vegetation.

**BEACH NOURISHMENT:** Placement of sand material on actively eroding beach sites identified in the Dredged Material Management Plan to maintain the historic beach profile. Beach nourishment does not include creation of new land area or beaches and must provide for the protection of estuarine resources (including habitat, nutrient, fish, wildlife, and aesthetic resources). Dredged material may be used for beach nourishment.

**BENEFICIARY:** With respect to Mitigation, any living organism, including human, that benefits from values and functions of wetlands and aquatic areas.

**BOAT HOUSE:** A floating or pile-supported structure used for the protection and storage of a boat or boats.

**BOAT RAMP:** An improved sloped surface extending from a shoreland area into an aquatic area suitable for removing a boat from the water and launching a boat into the water from a trailer.

**BRIDGE CROSSING:** The portion of a bridge spanning a waterway not including supporting structures or fill located in the waterway or adjacent wetlands.

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

**BULKHEAD:** A vertical wall of steel, timber or concrete used for erosion protection or as a retaining wall.

**COASTAL SHORELANDS:** Those areas immediately adjacent to the ocean, estuaries, associated wetlands, and coastal lakes. Coastal Shorelands are limited in landward extent by the coastal shorelands boundary, described in Oregon jurisdiction area plans.

**DIKE:** With regard to flood protection, a structure designed and built to prevent inundation of a parcel of land by water.

With regard to dredged material disposal, a structure consisting of sediments, rock, or other material designed to contain the dredged material and allow for settling of solids in a specific area while it is being deposited and after deposition has occurred.

**DOCK:** A pier or secured float or floats for boat tie-up or other water use.

**DREDGED MATERIAL:** Sediments, gravels, and other solids removed from an aquatic area.

**DREDGED MATERIAL DISPOSAL:** The deposition of dredged materials in aquatic or land areas. Methods include land disposal (deposition in specific land areas or on the tops and landward sides of flood protection dikes) and in-water disposal (including beach nourishment, flow-lane disposal, estuarine open water disposal, agitation dredging, and ocean disposal).

**DREDGING:** The extraction or displacement of aquatic sediment or other material for the purpose of deepening an area, obtaining fill material, or mining and mineral extraction.

**DRIFT RIGHT:** A specific area or section of river bottom that has been cleared of snags and sunken debris and is shared and actively maintained by a group of fishermen as their fishing grounds.

**DUCK SHACK:** A structure having no permanent water or sewage treatment connection which is used to store recreational equipment meant for hunting waterfowl and not exceeding 500 square feet on a float or pier not exceeding 750 square feet. Occupancy by a single individual of a duck shack shall be strictly limited to 15 days of any consecutive 30-day period.

**EFFLUENT:** With regard to water quality, treated or untreated liquid entering the estuary from a point source.

With regard to dredging, water, including dissolved and suspended materials, which flows from a dredged material disposal site.

**EMERGENCY:** With respect to the Columbia River estuary, emergency conditions are limited to: (a) Severe shoreline, bankline or dike erosion during a storm event or a high tide that threatens property or public safety; or (b) oil or hazardous waste spills subject to U. S. Coast Guard Captain of the Port (COTP) authority; or (c) a 100 year (or less frequent) flood event; or (d) flooding caused by a tsunami; or extreme sedimentation, such as that caused by the eruption of Mt. St. Helens.

**ESTUARINE ENHANCEMENT:** An action which results in a long-term improvement of existing estuarine functional characteristics and processes that is not the result of a creation or restoration action.

**ESTUARINE OPEN-WATER DREDGED MATERIAL DISPOSAL:** All types of in-water dredged material disposal within the estuary which do not fall into the

classifications of flowlane disposal, beach nourishment, sump disposal, agitation dredging and disposal to provide fill material for an approved aquatic area fill project.

**ESTUARY:** A body of water semi-enclosed by land, connected with the open ocean, and within which salt water is usually diluted by freshwater derived from the land. The estuary includes: estuarine water; intertidal areas; and submerged lands. For regulatory purposes, the Columbia River Estuary extends to the western edge of Puget Island on the Oregon side, to the Wahkiakum-Cowlitz County line on the Washington side, and to the head of tide for all tributaries.

**FILL:** The placement by man of sand, sediment, or other material, to create new uplands or raise the elevation of land.

**FLOATING RESIDENCE:** A dwelling unit which floats on a water body and is designed such that it does not come into contact with land except by ramp. Floating residences may also be referred to as floating homes or houseboats. A floating residence is not equivalent to a duck shack or other similar recreational structure designed for temporary use. It is not equivalent to a boat house, designed for storage of boats.

**FLOWLANE DREDGED MATERIAL DISPOSAL:** Deposition of dredged material in or adjacent to a natural or maintained navigation channel in an area where the prevailing sediment transport will carry the material downstream.

**INCIDENTAL USE:** A use that is in conjunction with, and smaller than the main part of the operation.

**IN-KIND:** With respect to mitigation, any actions that duplicate the full array of wetland and aquatic area characteristics that are lost or impaired by a development action.

**INTERTIDAL:** Between extreme low tide and the landward limit of aquatic vegetation.

**IN-WATER DREDGED MATERIAL DISPOSAL:** Deposition of dredged materials in an aquatic area. Methods include beach nourishment, flowlane disposal, estuarine open-water disposal, in-water sump disposal, agitation dredging and ocean disposal.

**LAND DISPOSAL:** Deposition of dredged material on uplands or shorelands, including on the top and landward sides of flood control dikes.

**MAINTENANCE AND REPAIR:** Routine upkeep of an existing structure or remedial restoration of a damaged structure. Maintenance and repair may involve changes in the structure's location, configuration, orientation, or alignment if these changes are limited to the minimum amount necessary to retain or restore its operation or function or to meet current building or engineering standards.

**MAINTENANCE DREDGING:** Dredging of a channel, basin, or other facility which has been dredged before and is currently in use or operation or

has been in use or operation sometime during the past five years, provided that the dredging does not deepen the facility beyond its previously authorized or approved depth plus customary over-dredging.

**MARINA:** A facility which provides moorage, launching, storage, supplies and a variety of services for recreational, commercial, and fishing vessels. They are differentiated from individual docks and moorages by their larger scale, the provision of significant landside services or the use of a solid breakwater (rock, bulkheading, etc.).

**MARSHES, BOGS, SWAMPS:** Lands transitional between terrestrial and aquatic systems where saturation with water is the dominant factor determining plant and animal communities and soil development. For the purpose of this definition, these areas must have one or more of the following attributes:

- a) At least periodically, the land supports predominantly hydrophytes; and/or
- b) The substrate is predominantly undrained hydric soil.

**MINING AND MINERAL EXTRACTION:** The removal for economic use of minerals, petroleum resources, sands, gravels or other naturally occurring materials from shorelands or submerged lands.

**MINOR NAVIGATION IMPROVEMENTS:** Alterations necessary to provide water access to existing or permitted uses including dredging for access channels and for maintaining existing navigation but excluding fill and in-water navigational structures other than floating breakwaters or similar permeable wave barriers.

**MITIGATION:** Any action that, to some degree, softens the impact of development on wetlands and aquatic areas. This may include all or any one of the following actions: 1. avoiding the impact altogether by not taking a certain action or parts of an action; 2. minimizing impacts by limiting the degree or magnitude of an action and its implementation; 3. rectifying the impact by repairing; rehabilitation; or restoring the affected environment; 4. reducing or eliminating the impact over time by preservation and maintenance operations; and 5. compensating for the impact by creation, restoration, or enhancement of wetlands and aquatic areas to maintain their functional processes, such as natural biological productivity, habitat, and species diversity, unique features and water quality. Any mitigation action or combination of actions involves monitoring with remedial follow up action if necessary.

**MOORAGE:** Piling or a dock or both used to secure a boat or barge.

**NAVIGATION AIDES:** Beacons, buoys, range markers and other objects providing directional assistance.

**NAVIGATIONAL STRUCTURES:** Jetties, groins, pile dikes, breakwaters and other in-water structures designed to change or moderate hydraulic characteristics for the purpose of improving navigation.

**NEW DREDGING:** Dredging a channel, basin, or other facility that has not been dredged before; deepening an existing dredged channel, basin, or other facility beyond its previously authorized or approved depth; or dredging a channel, basin, or other facility that has not been in use or operation in the past five years.

**OCEAN FLOODING:** The flooding of lowland areas by salt water owing to tidal action, storm surge, or tsunamis (seismic sea waves). Land forms subject to ocean flooding include beaches, marshes, coastal lowlands, and lowlying interdune areas. Areas of ocean flooding are mapped by the Federal Emergency Management Agency (FEMA). Ocean flooding includes areas of velocity flooding and associated shallow marine flooding.

**OFF-SITE:** An area separated from the impact area by a significant distance and that offers little or no opportunity for reestablishing lost values and functions to original beneficiaries.

**ON-SITE:** An area adjacent to or near the impact area that offers a reasonable opportunity for reestablishing lost values and functions to original beneficiaries.

**OUT-OF-KIND:** Any action that replaces wetland or aquatic area characteristics that have been impaired or lost due to a development action with a different set of characteristics that are judged to be of equal or greater resource value.

**RECREATION:** Any experience voluntarily engaged in largely during leisure (discretionary time) from which the individual derives satisfaction.

**Coastal Recreation** occurs in offshore ocean waters, estuaries, and streams, along beaches and bluffs, and in adjacent shorelands. It includes a variety of activities, from swimming, scuba diving, boating, fishing, hunting, and use of dune buggies, shell collecting, painting, wildlife observation, and sightseeing, to coastal resorts and water-oriented restaurants.

**Low-Intensity Recreation** does not require developed facilities and can be accommodated without change to the area or resource. For example, boating, hunting, hiking, wildlife photography, and beach or shore activities can be low-intensity recreation. Facilities included as low-intensity recreation include picnic tables, trail signs, unpaved trails and portable restrooms.

**High-Intensity Recreation** uses specially built facilities, or occurs in such density or form that it requires or results in a modification of the area or resource. Campgrounds, golf courses, public beaches, and marinas are examples of high-intensity recreation.

**RESTORATION:** Revitalizing, returning, or replacing original attributes and amenities, such as natural biological productivity, aesthetic and cultural resources, which have been diminished or lost by past alterations, activities, or catastrophic events. For the purpose of Oregon Statewide Planning Goal 16, estuarine restoration means to revitalize or

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

**Active Restoration** involves the use of specific remedial actions, such as removing fills, installing water treatment facilities, rebuilding deteriorated urban waterfront areas, or returning diked areas to tidal influence.

**Passive Restoration** is the use of natural processes, sequences, and timing which occurs after the removal or reduction of adverse stresses without other specific positive remedial action (Mitigation Plan).

**RESTORATION AS MITIGATION:** For the purposes of Goal 16 estuarine restoration means to revitalize or reestablish functional characteristics and processes of the estuary diminished or lost by past alterations, activities, or catastrophic events. A restored area must be a shallow subtidal or an intertidal or tidal marsh area after alteration work is performed, and may not have been a functioning part of the estuarine system when alteration work began.

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

**RIPRAP:** A layer, facing, or protective mound of stones randomly placed to prevent erosion, scour or sloughing of a structure or embankment; also, the stone so used. In local usage, the similar use of other hard material, such as concrete rubble, is also frequently included as riprap.

**SHORELAND AREAS:** The lands and nontidal wetlands along the estuary shore. Shoreland designations extend waterward to the upper limit of aquatic vegetation or, where aquatic vegetation is absent, Mean Higher High Water.

**SHORELAND RESOURCES, SIGNIFICANT:** Significant shoreland resources are described in subarea plans, and are included in Oregon jurisdiction Coastal Shorelands Boundaries. Significant shoreland resources include significant nontidal wetlands, significant shoreland fish and wildlife habitat, significant riparian vegetation, exceptional aesthetic resources and coastal headlands.

**SHORELINE:** The boundary line between a body of water and the land, measured on tidal waters at the landward limit of aquatic vegetation or, where aquatic vegetation is absent, Mean Higher High Water; and on non-tidal waterways at the ordinary high water mark.

**SHORELINE STABILIZATION:** The protection from erosion and sloughing of the banks of tidal and nontidal streams, rivers, lakes or estuaries by vegetative or structural means.

**Vegetative Shoreline Stabilization:** Use of plants that anchor the soil to prevent shoreline erosion and sloughing.

**Structural Shoreline Stabilization:** Use of riprap, bulkheads, seawalls or other non-vegetative material to prevent shoreline erosion.

**SHORELINES (WASHINGTON):** The Washington Shoreline Management Act applies to all areas of the state, including reservoirs, and their associated wetlands, together with the lands underlying them; except (i) shorelines of state-wide significance; (ii) shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and (iii) shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes.

**SUBTIDAL:** Below the level of extreme low tide. In the Columbia River Estuary this is generally 3 feet below Mean Lower Low Water.

**SUMP DREDGED MATERIAL DISPOSAL, IN-WATER:** Deposition of dredged materials in a temporary in-water holding area and subsequently rehandling the material to place it on a land disposal site.

**TEMPORARY ESTUARINE ALTERATION (Oregon Only):** Dredging, filling, or other estuarine alteration occurring over a specified short period of time which is needed to facilitate an allowed use. Temporary alterations may not be for more than three years and the affected area must be restored to its previous condition. Temporary alterations include: (1) alterations necessary for federally authorized navigation projects (e.g., access to dredged material disposal sites by barge or pipeline and staging areas or dredging for jetty maintenance), (2) alterations to establish mitigation sites, alterations for bridge construction or repair and for drilling or other exploratory operations, and (3) minor structures (such as blinds) necessary for research and educational observation.

**TEMPORARY USE:** A non-permanent structure, use or activity involving minimal capital investment that does not result in the permanent alteration of the site and is removed from the site within 3 years.

**TIDAL MARSH:** Tidal wetlands vegetated with emergent vascular plants lying between extreme low tide and landward limit of aquatic vegetation.

**TIDEGATE:** A device placed in a dike or dam that allows the passage of water through a culvert in a single direction.

**TRANSPORTATION FACILITIES:** Highways, streets, and roads, railroads, bridges and associated structures which provide for land transportation of motorized and/or nonmotorized vehicles (excluding logging roads).

**WATER-DEPENDENT:** A use or activity which can be carried out only on, in, or adjacent to water areas because the use requires access to the water body for water-borne transportation, recreation, energy production, or source of water.

**WATER-ORIENTED:** A use whose attraction to the public is enhanced by a view of or access to coastal waters.

**WATER-RELATED:** Uses which are not directly dependent upon access to a water body, but which provide goods or services that are directly associated with water-dependent land or waterway use, and which, if not located adjacent to water, would result in a public loss of quality in the goods or services offered. Except as necessary for water-dependent or water-related uses or facilities, residences, parking lots, spoil and dump sites, roads and highways, restaurants, businesses, factories, and trailer parks are not generally considered dependent on or related to water location needs.

**WETLAND CREATION:** Alteration, by excavation or other means, of upland areas to allow local hydrologic conditions to convert soils and vegetation to a hydric character.

**WETLAND ENHANCEMENT:** An action which results in a long term improvement of existing wetland functional characteristics and processes that is not the result of a creation or restoration action.

**WETLANDS:**

**In Washington:** Lands transitional between terrestrial and aquatic systems where saturation with water is the dominant factor determining plant and animal communities and soil development. For the purpose of this definition, these areas must have one or more of the following attributes: 1. at least periodically, the land supports predominantly hydrophytes and/or 2. the substrate is predominantly undrained hydric soil.

**In Oregon:** Land areas where water is the dominant factor determining the nature of soil development and the types of plant and animal communities living at the soil surface. Wetland soils retain sufficient moisture to support aquatic or semi-aquatic plant life. In marine and estuarine areas, wetlands are bounded at the lower extreme by extreme low water; in nontidal areas by a depth of 6 feet. The areas below wetlands are submerged lands.

**WETLANDS, SIGNIFICANT NONTIDAL:** Nontidal wetlands described as significant in Oregon subarea plan Coastal Shorelands boundary descriptions or described as significant in Oregon jurisdictions Goal 5 elements.

**3.3. POLICIES AND STANDARDS**

This subsection establishes use and activity policies and standards for developments in Columbia River Estuary aquatic areas and shorelands. Some apply only to the estuary's waters and tidal wetlands: These are indicated by the qualifying phrase "aquatic areas" or "aquatic designations." Policies and standards applicable only to estuary shorelands, including associated non-tidal wetland areas, are so indicated by the phrase "shoreland areas" or "shoreland designations."



### 3.3.1. Agriculture and Forestry

Policies and standards in this subsection are applicable to agricultural and forestry activities on Columbia River Estuary shorelands. Activities outside of the coastal shorelands boundary (Oregon) or outside of Shoreland Management Act jurisdiction (Washington) are not covered by this subsection. Certain uses and activities associated with agriculture and forestry, such as log storage, dike maintenance, and shipping facilities for agricultural and forestry products, are covered under different policies and standards.

#### Policies

1. Continued use of productive agricultural land is encouraged. Conversion to non-agricultural uses, except in urban areas, is discouraged.
2. Existing dikes and tide gates and drainage systems protecting productive agricultural land shall be maintained consistent with dike maintenance policies and standards, unless part of an approved restoration or mitigation project.
3. Potential water quality degradation resulting from agricultural or forest management practices shall be controlled by Soil Conservation Service programs, programs under section 208 of the 1972 Federal Water Pollution Control Act Amendments, and State forest practice rules (the Oregon Forest Practices Act and its Administrative Rules, or the Washington Forest Practices Act and its Administrative Code).
4. Shoreland resources that are significant under Oregon Statewide Planning Goal 17 that occur in forested areas outside of Urban Growth Boundaries shall be protected by the Oregon Forest Practices Act and its Administrative Rules. (Oregon only).
5. Only selective timber cutting may be permitted within 200 feet of the Columbia River Estuary Shoreline (this does not apply to tributaries of the Columbia River). No more than 30% of the merchantable trees may be harvested in any ten year period. Other timber harvesting methods may be permitted in limited instances where topography, soil conditions or silviculture practices necessary for regeneration render selective logging ecologically detrimental. Clear cutting of timber which is solely incidental to the preparation of land for other uses authorized by this chapter may be permitted. (Washington only).

#### Standards

6. Tillage and drainage practices should minimize sedimentation and control surface water runoff of animal wastes, fertilizers, and pesticides. Agricultural chemicals shall be applied in a manner that minimizes the amount lost to the aquatic environment.
7. Runoff from feed lots or other confinement lots for livestock shall be controlled with diversion structures, settling ponds or other land management practices.

8. Forest practices and forest road building will comply with rules established under the Oregon Forest Practices Act, administered by the Oregon Department of Forestry, or the Washington Forest Practices Act, administered by the Washington Department of Natural Resources.

### 3.3.2. Deep-Water Navigation, Port and Industrial Development

The policies and standards in this subsection apply to port and industrial development occurring in and over Columbia River Estuary waters, and on adjacent shorelands. This section also applies to navigation projects related to deep-draft maritime activities, such as channel, anchorage and turning basin development or expansion.

#### **Policies**

1. Shorelands with adjacent deep-water access, adequate rail or road access, and sufficient backup land shall be reserved for water-dependent recreational, commercial, industrial, or port development.
2. Federally-designated channels, anchorages and turning basins, including necessary side slopes, shall be in Development Aquatic designations.
3. Development, improvement and expansion of existing port sites is preferred prior to designation of new port sites.
4. Aides to navigation, including range markers, buoys, channel markers and beacons, shall be protected from development impacts that would render them ineffective. This policy does not preclude development subject to U.S. Coast Guard approved re-orientation or relocation of navigation aides.
5. Evaluation of proposals involving treated or untreated wastewater discharge into the estuary will rely on the point source water pollution control programs administered by the Oregon Department of Environmental Quality and the Washington Department of Ecology.

#### **Standards**

6. Port or industrial development in or over estuarine aquatic areas involving the activities which could adversely affect estuarine physical or biological resources shall be subject to an Impact Assessment (Subsection 3.4.1.) (Oregon only).
7. Shoreland and aquatic area facilities for the storage or transmission of petroleum products must have on-site equipment for the containment of oil spills.
8. Deep-water navigation, port or industrial development requiring aquatic area dredging or filling may be allowed only if all of the following criteria are met:

- (a) The proposed use is required for navigation or other water-dependent use requiring an estuarine location, or if specifically allowed in the applicable aquatic designation; and
- (b) A substantial public benefit is demonstrated; and
- (c) The proposed use does not unreasonably interfere with public trust rights; and
- (d) Feasible alternative upland locations do not exist; and
- (e) Potential adverse impacts are minimized.

9. Deep-water navigation, port or industrial development requiring new piling or dolphin installation, construction of pile-supported structures, or other uses or activities which could alter the estuary may be permitted only if all of the following criteria are met:

- (a) A substantial public benefit is demonstrated; and
- (b) The proposed use does not unreasonably interfere with public trust rights; and
- (c) Feasible alternative upland locations do not exist; and
- (d) Potential adverse impacts are minimized.

10. Off-street parking may only be located over an aquatic area if all of the following conditions are met:

- (a) Parking will be on an existing pile-supported structure; and
- (b) Suitable shoreland areas are not available; and
- (c) The amount of aquatic area committed to parking is minimized; and
- (d) The aquatic area is in a Development designation.

### 3.3.3. Diking

The policies and standards in this subsection apply to the construction, maintenance and repair of flood control dikes in Columbia River Estuary shoreland and aquatic areas. These policies and standards do not apply to dredged material containment dikes.

#### **Policies**

1. Deliberate dike breaching or removal may be permitted as part of a restoration or mitigation project subject to the applicable Policies and Standards in Subsection 3.3.12..

2. New dike alignment or configuration shall not cause an increase in erosion or shoaling in adjacent areas, or an appreciable increase in seasonal water levels behind dikes. Waterway channelization shall be avoided.

3. New dikes shall be placed on shorelands rather than in aquatic areas unless part of an approved fill project, as a temporary flood protection measure, or (Oregon only) subject to an exception to the Statewide Planning Goal 16.

4. The effects of limited intertidal dredging along fringing marshes for the purposes of dike maintenance are not well-known. A small pilot project to determine these impacts should be undertaken.

### Standards

5. Dike maintenance and repair may be allowed under any of the following circumstances:

- (a) Dikes which have been inadvertently breached may be repaired, subject to state and federal permit requirements, if the repair is commenced within 36 months of the breach, regardless of whether the property has reverted to estuarine habitat.
- (b) Existing serviceable dikes (including those that allow some seasonal inundation) may be repaired.
- (c) Dikes which have been inadvertently breached may be repaired, subject to state and federal permit requirements, if the property has not reverted to estuarine habitat (as determined by U.S. Army Corps of Engineers and either Oregon Division of State Lands or the Washington Department of Ecology).

Dike repair projects that do not fit under (a), (b), or (c) above; that is projects where the property has reverted and more than 36 months have elapsed; must be reviewed as new dikes.

6. Dike maintenance and repair are distinguished from new dike construction. To qualify as maintenance and repair, changes in the location, size, configuration, orientation and alignment of the dike must be limited to the minimum amount necessary to retain or restore its operation or function or to meet current engineering standards. Filling aquatic areas for dike maintenance may be allowed only if it can be clearly demonstrated that there are no feasible engineering alternatives which would avoid the use of aquatic area fill.

7. The outside dike face shall be suitably protected from erosion during construction and maintenance operations. Shoreline stabilization standards shall be met.

8. New dikes in aquatic areas may be permitted either;

- (a) As part of an approved fill project; or

- (b) As a temporary flood protection measure needed to promote public safety and welfare, subject to applicable U. S. Army Corps of Engineers, and Oregon Division of State Lands rules; or
- (c) In Oregon jurisdictions, subject to an exception to Statewide Planning Goal 16.

9. Dredging of subtidal estuarine aquatic areas as a source of fill material for dike maintenance may be allowed (in Oregon, pursuant to the exception to Oregon Statewide Planning Goal 16) if all of the following conditions are met:

- (a) Alternative methods of accomplishing dike maintenance are infeasible (i.e., dikes proposed for receiving dredged material are remote from upland sources of fill material or land-based heavy equipment access to the dike area is not possible); and
- (b) Dredging in all cases is limited to that necessary to maintain the dikes. Dredging as a source of fill material for dike maintenance does not include enlarging or changing the bottom contour of natural aquatic areas for navigation or any other aquatic area use; and
- (c) Dredging will not disturb or excavate emergent vegetation, intertidal flats, or other adjacent intertidal estuarine resources; and
- (d) Dredging as a source of fill material for dike maintenance will, in all cases, take place in subtidal aquatic areas, and shall be limited to the deepest subtidal aquatic area accessible to float-mounted dredging equipment. In narrow tributary areas of the estuary, dredging shall be limited to the deepest subtidal areas nearest the center line of the waterway. In reaches of the estuary exceeding 200 feet in width, dredging shall be limited to subtidal areas more than 80 feet from the waterward toe of the dike. The intent of this standard is to protect the dike structures from sloughing, maintain existing berms and shoal water immediately adjacent to dikes, and limit dredge excavations to subtidal areas below the level of effective light penetration; and
- (e) Dredging will not be confined to localized areas of river bottom. All excavations as a source of fill material shall be lineally dispersed along the entire dike maintenance area. Dredging shall not alter the existing contour of the river bottom such that deep trenches and pockets capable of stranding or impeding estuarine lifeforms will be created; and
- (f) Dredging operations shall be consistent with state and federal permit conditions and the requirements of local governments to ensure that project timing and dredging conditions protect estuarine resources (e.g., fish runs, spawning activity,

benthic productivity, wildlife habitat, etc.).

#### 3.3.4. Dredging and Dredged Material Disposal

Policies and standards in this subsection are applicable to all estuarine dredging operations and to both estuarine shoreland and aquatic dredged material disposal in the Columbia River Estuary.

##### Dredging and Dredged Material Disposal Policies

1. Dredging shall be allowed only:
    - a. If required for navigation or other water-dependent uses that require an estuarine location or if specifically allowed by the applicable designation unit requirements; and,
    - b. If a need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and,
    - c. If no feasible alternative upland locations exist; and,
    - d. If adverse impacts are minimized.
  2. Dredging and dredged material disposal shall not disturb more than the minimum area necessary for the project and shall be conducted and timed so as to minimize impacts on wetlands and other estuarine resources. Loss or disruption of fish and wildlife habitat and damage to essential properties of the estuarine resource shall be minimized by careful location, design, and construction of:
    - a. Facilities requiring dredging,
    - b. Sites designated to receive dredged material, and
    - c. Dredging operation staging areas and equipment marshalling yards.
- Dredged materials shall not be placed in intertidal or tidal marsh habitats or in other areas that local, state, or federal regulatory agencies determine to be unsuitable for dredged material disposal. Exceptions to the requirement concerning disposal in an intertidal or tidal marsh area include use of dredged material as a fill associated with an approved fill project or placement of dredged materials in the sandy intertidal area of a designated beach nourishment site. Land disposal shall enhance or be compatible with the final use of the site area.
3. The effects of both initial and subsequent maintenance dredging, as well as dredging equipment marshalling and staging, shall be considered prior to approval of new projects or expansion of existing projects.

Projects shall not be approved unless disposal sites with adequate capacity to meet initial excavation dredging and at least five (5) years of expected maintenance dredging requirements are available.

4. Dredging subtidal areas to obtain fill material for dike maintenance may be allowed subject to Dredging Standard 9.

Some dikes in the estuary are not accessible by barge-mounted dredges or land-based equipment. Dredging intertidal areas to obtain fill material may be the only option for maintaining these dikes. In Oregon, approval of intertidal dredging will require an exception to Statewide Planning Goal 16.

5. Where a dredged material disposal site is vegetated, disposal should occur on the smallest land area consistent with sound disposal methods (e.g., providing for adequate dewatering of dredged sediments, and avoiding degradation of receiving waters). Clearing of land should occur in stages and only as needed. It may, however, be desirable to clear and fill an entire site at one time, if the site will be used for development immediately after dredged material disposal. Reuse of existing disposal sites is preferred to the creation of new sites provided that the dikes surrounding the site are adequate or can be made adequate to contain the dredged materials.

#### Dredged Material Disposal Site Selection And Site Reservation Policies

1. When identifying land dredged material disposal sites, emphasis shall be placed on sites where (not in priority order):
  - a. The local designation is Development provided that the disposal does not preclude future development at the site;
  - b. The potential for the site's final use will benefit from deposition of dredged materials;
  - c. Material may be stockpiled for future use;
  - d. Dredged spoils containing organic, chemical, and/or other potentially toxic or polluted materials will be properly contained, presenting minimal health and environmental hazards due to leaching or other redistribution of contaminated materials;
  - e. Placement of dredged material will help restore degraded habitat; or where
  - f. Wetlands would not be impacted.
  - g. (Washington Jurisdictions add: "The land is owned by the state or, secondly, where the land is owned or leased by a county, port, or other public entity.")

Important fish and wildlife habitat, or areas with scenic, recreational, archaeological, or historical values that would not benefit from dredged material disposal and sites where the present intensity or type of use is inconsistent with dredged material disposal shall be avoided. (Oregon jurisdictions add: "The use of agricultural or forest lands for dredged material disposal shall occur only when the project sponsor can demonstrate that the soils can be restored to agricultural or forest productivity after disposal use is completed. In cases where this demonstration cannot be made, an exception to the Oregon Statewide Planning Goal 3 or 4 must be approved prior to the use of the site for dredged material disposal. The use of shoreland water-dependent development sites for dredged material disposal shall occur only when the project sponsor can demonstrate that the dredged material placed on the site will be compatible with current and future water-dependent development. Dredged material disposal shall not occur in wetlands designated as significant under Oregon Statewide Planning Goal 17.)

Engineering factors to be considered in site selection shall include: size and capacity of the site; dredging method; composition of the dredged materials; distance from dredging operation; control of drainage from the site; elevation; and the costs of site acquisition, preparation and revegetation.

2. Estuarine in-water disposal sites shall be in Development designated areas identified as low in benthic productivity, unless the disposal is to provide fill material for an approved fill project, and where disposal at the site will not have significant adverse hydraulic effects. Estuarine in-water disposal sites shall only be designated and used when it is demonstrated that no feasible land or ocean disposal sites with less damaging environmental impacts can be identified and biological and physical impacts are minimal. An in-water disposal site shall not be used if sufficient sediment type and benthic data are not available to characterize the site.

3. Flowlane disposal sites shall only be allowed in Development designated areas within or adjacent to a channel. The Development designated area adjacent to the channel shall be defined by a line 600 feet from either side of the channel or the 20-foot bathymetric contour, whichever is closer to the channel. Flowlane disposal within this area shall only be allowed where:

- a. Sediments can reasonably be expected to be transported downstream without excessive shoaling,
- b. Interference with recreational and commercial fishing operations, including snag removal from gillnet drifts, will be minimal or can be minimized by applying specific restrictions on timing or disposal techniques,
- c. Adverse hydraulic effects will be minimal,
- d. Adverse effects on estuarine resources will be minimal, and
- e. The disposal site depth is between 20 and 65 feet below MLLW.



4. Beach nourishment sites shall only be designated on sandy beaches currently experiencing active erosion. Dredged material disposal at beach nourishment sites shall only be used to offset the erosion and not to create new beach or land areas. Beach nourishment sites shall not be designated in areas where placement or subsequent erosion of the dredged materials would adversely impact tidal marshes or productive intertidal or shallow subtidal areas. (Oregon Jurisdictions add: "Designation of new beach nourishment sites shall require an exception to Statewide Planning Goal 16.)

5. Dredged material disposal sites with adequate capacity to accommodate anticipated dredging needs for at least a five year period shall be identified and designated. Additional sites may also be designated. All dredged material disposal sites shall receive a Priority I or II designation with respect to its suitability and importance for meeting five-year dredging needs.

A. Priority 1 Dredged Material Disposal Sites

Sites which are essential for meeting anticipated five-year disposal needs shall receive a Priority 1 designation. Priority 1 shoreland sites shall be protected from incompatible and preemptive uses to ensure adequate sites will remain available to accommodate five-year disposal needs. Incompatible and preemptive uses include:

- Uses requiring substantial structural or capital improvements (e.g., construction of permanent buildings, water and sewer service connections);
- Uses that require alteration of the topography of the site, thereby affecting the drainage of the area or reducing the potential useable volume of the dredged material disposal site (e.g., extensive site grading or excavation, elevation by placement of fill materials other than dredged spoils);
- Uses that include changes made to the site that would prevent expeditious use of the site for dredged material disposal. Such uses would delay deposition of dredged material on the site beyond the period of time commonly required to obtain the necessary federal, state and local dredging and dredged material disposal permits (approximately 90 days);

(Note: Examples of non-preemptive or compatible uses of shoreland dredged material disposal sites are: unimproved parking lots, equipment storage yards, materials marshalling yards, log storage and sorting yards, and undeveloped recreation areas, campgrounds or recreational vehicle parking areas.)

Incompatible or preemptive uses shall not be allowed at shoreland Priority 1 dredged material disposal sites unless the site is removed by plan amendment upon demonstration that either:

1. The site has been filled to capacity and is available for other uses, or

2. The site is, in fact, not required to accommodate anticipated five-year disposal needs, or
3. A new Priority I site has been designated to replace the site being removed.

B. Priority II Dredged Material Disposal Sites

Dredged material disposal sites which are not required for anticipated five-year disposal needs but which may be required to meet longer-range needs shall be given a Priority II designation. The importance of these sites, as compared with Priority I sites, does not justify efforts to reserve all or portions of each site from possible preemptive uses.

A 30-day freeze shall be placed on preemptive development requests (as defined in "A", above), for the purpose of allowing affected government agencies or private interests to negotiate for the use of the property as a disposal site. Individual jurisdictions may choose to run this freeze concurrently or in addition to the normal permit process. If there is no expressed interest in use of the site for dredged material disposal during the freeze period, the development request shall be reviewed under normal procedures. If the request is approved, the entire site or affected portions of the site shall be removed from the dredged material disposal plan by plan amendment.

6. In order to ensure the adequacy of identified dredged material disposal site capacities for anticipated five-year disposal requirements, an analysis of the dredge material disposal site inventory shall be completed every five years. The analysis shall include:

- a. A determination of the Priority I sites utilized for dredged material disposal and the volume received by each site during the preceding period, noting also the project source of the dredged material and the interval separating the most recent from the next anticipated dredging event.
- b. A determination of the number and usable volume of Priority I sites remaining in the inventory, and the relationship between these sites and present or expected navigation-related dredging or water-dependent development projects in the following five year period, and the number and useable volume of Priority II sites identified in the inventory.
- c. An identification of the Priority II or other additional sites to be added to the Priority I inventory.
- d. An analysis of the adequacy of the dredged material site inventory shall include notification of an communication of up-dated inventory information to affected property owners and local, state and federal governmental agencies. Of particular importance is the addition, deletion, or change in priority of dredged material disposal sites.
- e. Each jurisdiction shall cooperate with other jurisdictions on

the Columbia River Estuary in monitoring of dredged material site availability and in dredged material disposal plan update.

### Dredging Standards

1. Dredging in estuarine aquatic areas, subject to dredging and dredged material disposal policies and standards, shall be allowed only:
  - a. If specifically allowed by the applicable designation and required for one or more of following uses and activities:
    1. Navigation or navigational access;
    2. An approved water dependent use of aquatic areas or adjacent shorelands that requires an estuarine location;
    3. An approved restoration project;
    4. Mining or mineral extraction;
    5. Excavation necessary for approved bridge crossing support structures, or pipeline, cable, or utility crossing;
    6. Obtaining fill material for dike maintenance (Oregon jurisdictions add: "where an exception to Oregon State-wide Planning Goal 16 has been approved");
    7. Maintenance of existing tidegates and tidegate drainage channels;
    8. Aquaculture facilities;
    9. Temporary alterations;
    10. Installation of tidegates in existing functional dikes;
    11. Incidental dredging for harvest of benthic species or removable in-water structures such as stakes or racks.
  - b. If a need (i.e., a substantial public benefit) is demonstrated and the use or alteration does not unreasonably interfere with public trust rights; and
  - c. If no feasible alternative upland locations exist; and
  - d. If adverse impacts are minimized.
2. When dredging is permitted, the dredging shall be the minimum necessary to accomplish the proposed use.
3. Undesirable erosion, sedimentation, increased flood hazard, and other changes in circulation shall be avoided at the dredging and

disposal site and in adjacent areas.

4. The timing of dredging and dredged material disposal operations shall be coordinated with state and federal resource agencies, local governments, and private interests to protect estuarine aquatic and shoreland resources, minimize interference with commercial and recreational fishing, including snag removal from gillnet drifts, and insure proper flushing of sediment and other materials introduced into the water by the project.

5. Bottom sediments in the dredging area shall be characterized by the applicant in accordance with U.S. Environmental Protection Agency, Washington Department of Ecology, and Oregon Department of Environmental Quality standards. Information that may be required includes, but is not limited to, sediment grain size distribution, organic content, oil and grease, selected heavy metals, pesticides and other organic compounds, and benthic biological studies.

The types of sediment tests required will depend on dredging and disposal techniques, sediment grain size, available data on the sediments at the dredging site, and proximity to contaminant sources. Generally, projects involving in-water disposal of fine sediments will require a higher level of sediment testing than projects involving disposal of coarse sediments. Projects involving upland disposal may be exempted from the testing requirement, depending on the nature of the sediments and the amount of existing sediment data available.

In order to avoid unreasonable burdens on the permit applicant, consideration shall be given to the economic cost of performing the sediment evaluation, the utility of the data to be provided, and the nature and magnitude of any potential environmental effect.

6. Adverse short-term effects of dredging and aquatic area disposal such as increased turbidity, release of organic and inorganic materials or toxic substances, depletion of dissolved oxygen, disruption of the food chain, loss of benthic productivity, and disturbance of fish runs and important localized biological communities shall be minimized.

7. The effects of both initial and subsequent maintenance dredging, as well as dredging equipment marshalling and staging, shall be considered prior to approval of new projects or expansion of existing projects. Projects will not be approved unless disposal sites with adequate capacity to meet initial excavation dredging and at least five years of expected maintenance dredging requirements are available.

8. Dredging for maintenance of existing tidegate drainage channels and drainage ways is limited to the amount necessary to maintain and restore flow capacity essential for the function (the drainage service provided by the tidegate) of tidegates and to allow drainage and protection of agricultural and developed areas. Tidegate maintenance dredging does not include enlarging or extending the dimensions of, or changing the bottom elevations of, the affected tidegate drainage channel or drainage way as it existed prior to the accumulation of sediments.

9. Dredging of subtidal estuarine areas as a source of fill material for dike maintenance requires an exception to Oregon Statewide Planning Goal 16. This dredging activity may be allowed upon the applicant's demonstration that:

- a. Alternative methods of accomplishing dike maintenance are infeasible (i.e., dikes proposed for receiving dredged material are remote from upland sources of fill material and that land-based heavy equipment access to the dike area is not possible);
- b. Dredging in all cases will be limited to that necessary to maintain the dikes. Dredging as a source of fill material for dike maintenance does not include enlarging or changing the bottom contour of natural aquatic areas for navigation or any other aquatic area use;
- c. Dredging will not disturb or excavate emergent vegetation, intertidal flats, or other adjacent intertidal estuarine resources;
- d. Dredging as a source of fill material for dike maintenance will, in all cases, take place in subtidal aquatic areas, and shall be limited to the deepest subtidal aquatic area accessible to float-mounted dredging equipment. In narrow tributary areas of the estuary, dredging shall be limited to the deepest subtidal areas nearest the centerline of the waterway. In reaches of the estuary exceeding 200 feet in width, dredging shall be limited to subtidal areas greater than 80 feet in distance from the waterward toe of the dikes. The intent of this standard is to protect the dike structures from sloughing, maintain existing berms and shoal water immediately adjacent to dikes, and limit dredge excavations to subtidal areas below the level of effective light penetration.
- e. Dredging will not be confined to localized areas of river bottom. All excavations as a source of fill material shall be lineally dispersed along the entire dike maintenance area. Dredging shall not alter the existing contour of the river bottom such that deep trenches and pockets capable of stranding or impeding estuarine lifeforms will be created.
- f. Dredging operations shall be consistent with state and federal resource agency conditions, the requirements of local governments, and concerns of private interests, to ensure that project timing and dredging conditions protect estuarine resources (e.g., fish runs, spawning activity, benthic productivity, wildlife habitat, etc.)

10. Dredging for mining and mineral extraction, including sand extraction, shall only be allowed in areas deeper than 10 feet below MLLW where the project sponsor demonstrates that mining and mineral extraction in aquatic areas is necessary because no feasible upland sites exist and that the project will not significantly impact estuarine

resources. The estuary bottom at the project site shall be sloped so that sediments from areas shallower than 10 feet below MLLW and other areas not included in the project do not slough into the dredged area. Dredging as part of an approved dredging project which also provides fill for an approved fill project shall not be subject to this standard.

11. When proposing dredging for sand extraction, the project sponsor shall first consider obtaining the material from a shoaled area within a federally-authorized navigation channel that is currently shallower than its authorized depth. Said dredging shall be coordinated with the U.S. Army Corps of Engineers. The dredging depth shall not exceed the authorized channel depth plus any over-dredging that the Corps would normally perform while maintaining the site.

12. New dredging in Conservation Aquatic designations may be permitted only for: (Oregon only)

- a. Aquaculture;
- b. High intensity water-dependent recreation, including boat ramps and marinas;
- c. Minor navigational improvements;
- d. Mineral extraction;
- e. Obtaining fill material for dike maintenance where a Goal 16 exception has been approved;
- f. Active restoration;
- g. Bridge crossing support structures;
- h. Pipelines, cables, and utility crossings;
- i. Maintenance of existing functional tidegates and associated drainage channels;
- j. Temporary alterations;
- k. Installation of tidegates in existing functional dikes;
- l. Incidental dredging for harvest of benthic species or removable in-water structures such as stakes or racks.

Dredging for items a, b, c, d, f, or j shall be allowed only where said dredging is consistent with the resource capabilities of the affected designation.

13. New dredging in Natural Aquatic designations may be permitted only for: (Oregon only)

- a. Maintenance or installation of bridge crossing support structures;

- b. Obtaining fill material for dike maintenance where a Goal 16 exception has been approved;
- c. Maintenance of existing functional tidegates and associated drainage channels;
- d. Pipelines, cables, and utility crossings;
- e. Temporary alterations;
- f. Installation of tidegates in existing functional dikes;
- g. Incidental dredging for harvest of benthic species or removable in-water structures such as stakes or racks.

Dredging for installation of bridge crossing support structures and for items d, e, f, and g shall be allowed only where said dredging is consistent with the resource capabilities of the affected designations.

#### Dredged Material Disposal Standards

1. Dredged material disposal shall occur only at designated sites or at new sites which meet the requirements of the Dredged Material Disposal Site Selection Policies.
2. Proposals for in-water disposal of dredged materials, including flowlane disposal, beach nourishment, estuarine open-water disposal, ocean disposal, and agitation dredging, shall:
  - a. Demonstrate the need for the proposed action and that there are no feasible alternative disposal sites or methods that entail less damaging environmental impacts; and
  - b. Demonstrate that the dredged sediments meet state and federal sediment testing requirements and water quality standards (see Dredging Standard 5); and
  - c. Not be permitted in the vicinity of a public water intake.
3. Proposals for in-water estuary disposal shall be coordinated with commercial fishing interests, including, but not limited to: gillnet drift captains at the dredging and disposal site, the Columbia River Fisherman's Protective Union, Northwest Gillnetters Association, and the State fishery agencies. In-water disposal actions shall avoid gillnet drifts whenever feasible. When it is not feasible to avoid gillnet drifts, impacts shall be minimized in coordination with fisheries interests through:
  - a. Disposal timing,
  - b. Gear placement,
  - c. Choice of disposal area within the drift, and

d. Disposal techniques to avoid snag placement.

4. Flowlane disposal, estuarine open water disposal and agitation dredging shall be monitored to assure that estuarine sedimentation is consistent with the resource capabilities and purpose of affected natural and conservation designations. The monitoring program shall be established prior to undertaking disposal. The program shall be designed to both characterize baseline conditions prior to disposal and monitor the effects of the disposal. The primary goals of the monitoring are to determine if the disposal is resulting in measurable adverse impacts and to establish methods to minimize impacts. Monitoring shall include, at a minimum, physical measurements such as bathymetric changes and may include biological monitoring. Specific monitoring requirements shall be based on, at a minimum, sediment grain size at the dredging and disposal site, presence of contaminants, proximity to sensitive habitats and knowledge of resources and physical characteristics of the disposal site.

The monitoring requirement shall be discontinued when adequate information has been gathered to determine impacts and establish an agreed-upon disposal volume and methodology. If the agreed-upon volume and methodology is altered, the monitoring requirement may be re-established. Monitoring may be waived on small projects where the impacts would be undetectable.

5. Flowlane disposal sites shall be in Development Aquatic areas identified as low in benthic productivity and use of these sites shall not have adverse hydraulic effects. Use of disposal sites in the estuary shall be allowed only when no feasible alternative land or ocean disposal sites with less damaging environmental impacts can be identified and the biological and physical impacts of flowlane disposal are demonstrated to be insignificant. The feasibility and desirability of alternative sites shall take into account, at a minimum:

- a. Operational constraints such as distance to the alternative sites;
- b. Sediment characteristics at the dredging site;
- c. Timing of the operation;
- d. Environmental Protection Agency constraints on the use of designated ocean disposal sites;
- e. The desirability of reserving some upland sites for potentially contaminated material only.

Long term use of a flowlane disposal site may only be allowed if monitoring confirms that the impacts are not significant. Flowlane disposal is contingent upon demonstration that:

- f. Significant adverse effects due to changes in biological and physical estuarine properties will not result;



- g. Flowlane disposal sites shall be shown able to transport sediment downstream without excessive shoaling, interference with recreational and commercial fishing operations, including the removal of snags from gillnet drifts, undesirable hydraulic effects, or adverse effects on estuarine resources (fish runs, spawning activity, benthic productivity, wildlife habitat, etc.).
6. Ocean disposal shall be conducted such that:
- a. The amount of material deposited at a site is compatible with benthic populations, other marine resources, and other uses of the area;
  - b. Interference with sport and commercial fishing is minimized;
  - c. Disposal is strictly confined to the sites designated by the U.S. Environmental Protection Agency; and
  - d. The disposal site does not shoal excessively and create dangerous wave and swell conditions.

7. Beach nourishment shall only be conducted at sites identified in the dredged material management plan. New sites may be added to the Plan by amendment (Oregon jurisdictions add: "after an exception to Oregon Statewide Planning Goal 16 for the site has been approved"). Beach nourishment shall be conducted such that:

- a. The beach is not widened beyond its historical profile. The historical profile shall be defined as the widest beach profile that existed prior to June 1986.
- b. The material placed on the beach consists of sand of equal or greater grain size than the sand existing on the beach.
- c. Placement and subsequent erosion of the materials does not adversely impact tidal marshes or productive intertidal and shallow subtidal areas.
- d. Efforts are made to maintain a stable beach profile.
- e. Dredged material is graded at a uniform slope and contoured to minimize juvenile fish stranding and hazards to beach users.

Use of beach nourishment sites shall be allowed only when no feasible land or ocean sites with less damaging environmental impacts can be identified.

The feasibility and desirability of alternative sites shall take into account, at a minimum:

- f. Operational constraints such as distance to the alternative sites;

- g. Sediment characteristics at the dredging site;
  - h. Timing of the operation;
  - i. Environmental Protection Agency constraints on the use of designated ocean disposal sites;
  - j. The desirability of reserving some upland sites for potentially contaminated material only.
8. Except as noted below, land disposal and site preparation shall be conducted such that:
- a. Surface runoff from disposal sites is controlled to protect water quality and prevent sedimentation of adjacent water bodies, wetlands, and drainage ways. Disposal runoff water must enter the receiving waterway through a controlled outfall at a location with adequate circulation and flushing characteristics. Underground springs and aquifers must be identified and protected;
  - b. Dikes are constructed according to accepted engineering standards and are adequate to support and contain the maximum potential height and volume of dredged materials at the site, and form a sufficiently large containment area to encourage proper ponding and to prevent the return of dredged materials into the waterway or estuary. Containment ponds and outfall weirs shall be designed to maintain adequate standing water at all times to further encourage settling of dredged materials. The dikes shall be constructed within the boundaries of the disposal site and shall be constructed of material obtained from within the site or other approved source.

Clean dredged material placed on land disposal sites located directly adjacent to designated beach nourishment sites may be allowed to flow directly into the waterway without conforming to "a" and "b", above, provided that all policies and standards for in-water disposal and beach nourishment are met and the dredged materials are not allowed to enter wetlands or the waterway in areas other than the designated beach nourishment site.

9. Land disposal sites which are not intended for dredged material disposal or development use within a two year period following disposal shall be revegetated as soon as site and weather conditions allow, unless habitat management plans agreed upon by resource management agencies specify that open sand areas should remain at the site. The project sponsor shall notify the local jurisdiction and state and federal permitting and resource management agencies when disposal is completed and shall coordinate revegetation with these agencies. The notification shall be sent to at least the following agencies: the local jurisdiction, U.S. Army Corps of Engineers, Soil Conservation Service, Division of State Lands (Oregon Projects), Oregon Department of Fish and Wildlife (Oregon Projects), and Washington Departments of Wildlife and Ecology (Washington Projects). Revegetation of a disposal site does not

preclude future use of the sites for dredged material disposal.

The disposal site design shall be reviewed to determine if wetlands or other habitats will form on the site during the period between disposal actions. The disposal permit may be conditioned to allow future disposal actions to fill the created wetlands or habitats.

10. The final height and slope after each use of a land dredged material disposal site shall be such that:
  - a. The site does not enlarge itself by sloughing and erosion into adjacent areas;
  - b. Loss of materials from the site during storms and freshets is minimized; and
  - c. Interference with the view from nearby residences, scenic points, and parks does not occur.

#### 3.3.5. Estuarine Construction: Piling and Dolphin Installation, Shoreline Stabilization and Navigational Structures

The policies and standards in this subsection apply to over-the-water and in-water structures such as docks, bulkheads, moorages, boat ramps, boat houses, jetties, pile dikes, breakwaters and other structures involving installation of piling or placement of riprap in Columbia River Estuary aquatic areas. This section does not apply to structures located entirely on shorelands or uplands, but does apply to structures, such as boat ramps, that are in both aquatic and shoreland designations.

##### **Policies**

1. Proper streamside vegetation management is the preferred method of shoreline stabilization, followed by planting of new vegetation, installation of riprap and installation of a bulkhead.
2. Navigational structures, such as breakwaters, jetties, groins, and pile dikes are major estuary alterations with long term biological and physical effects. Proposals for new or enlarged navigational structures, or for removal of existing structures, must demonstrate that expected benefits outweigh potential adverse impacts on estuarine productivity.
3. New uses in aquatic areas and in shoreland areas especially suited for water-dependent development that are not water-dependent, if permitted, shall not preclude or pose any significant conflicts with existing, proposed or probable future water-dependent uses on the site or in the vicinity.

##### **Standards**

4. Where land use management practices and vegetative stabilization is

shown not to be feasible (in terms of cost, effectiveness or other factors), structural means may be approved subject to applicable policies, standards and designation use restrictions.

5. Where structural shoreline stabilization is shown to be necessary because of the infeasibility of vegetative means, the choice among various structural means shall be made on a case by case basis. Factors to be considered include, but are not limited to:

- (a) Hydraulic features;
- (b) Shoreland habitat;
- (c) Adjacent land and water uses;
- (d) Aquatic habitat;
- (e) Water quality;
- (f) Engineering feasibility;
- (g) Navigation;
- (h) Impacts on public shoreline access.

6. Jetties, groins and breakwaters shall be constructed of clean, erosion-resistant materials from upland sources. In-stream gravels shall not be used, unless part of an approved mining project. Material size shall be appropriate for predicted wave, tide and current conditions.

7. Where a jetty, groin, breakwater or other in-water structure is proposed for erosion or flood control, the applicant shall demonstrate that non-structural solutions, such as land use management practices, or other structural solutions, such as riprap, will not adequately address the problem.

8. Piling or dolphin installation, structural shoreline stabilization, and other structures not involving dredge or fill, but which could alter the estuary may be allowed only if all of the following criteria are met:

- (a) A substantial public benefit is demonstrated; and
- (b) The proposed use does not unreasonably interfere with public trust rights; and
- (c) Feasible alternative upland locations do not exist; and
- (d) Potential adverse impacts, as identified in the impact assessment, are minimized.

9. Jetties, groins, breakwaters and piers requiring aquatic area fill may be allowed only if all of the following criteria are met:

- (a) The proposed use is required for navigation or other water-dependent use requiring an estuarine location, or if specifically allowed in the applicable aquatic designation; and
- (b) A substantial public benefit is demonstrated; and
- (c) The proposed use does not unreasonably interfere with public trust rights; and
- (d) Feasible alternative upland locations do not exist; and
- (e) Potential adverse impacts, as identified in the impact assessment, are minimized.

10. Proposals for bulkheads may be approved only if it is demonstrated that sloped riprap will not adequately fulfill the project's objectives.

11. Proposals for bulkheads or for riprap bankline slopes steeper than 1.5 to 1 (horizontal to vertical) must demonstrate that adequate shallow areas will be available for juvenile fish shelter, or that the area is not typically used for juvenile fish shelter.

12. Plant species utilized for vegetative stabilization shall be selected on the basis of potential sediment containment and fish and wildlife habitat values. Trees, shrubs and grasses native to the region should be considered for vegetative stabilization; however, plant species and vegetation stabilization techniques approved by the Soil Conservation Service, the U.S. Army Corps of Engineers and other participating federal and state resource agencies are also appropriate. Stabilization of dike slopes must not include vegetation (particularly trees) which jeopardize the dike.

13. Riprap bank protection must be appropriately designed with respect to slope, rock size, placement, underlying material and expected hydraulic conditions. Project design by a licensed engineer shall meet this requirement. The local government may also find that riprap projects designed by other individuals, such as experienced contractors, soil conservation service personnel or others, meets this standard.

14. Shoreline stabilization measures shall not restrict existing public access to public shorelines.

15. Shoreline stabilization shall not be used to increase land surface area. Where an avulsion has occurred, fill may be used to restore the previous bankline, so long as the corrective action is initiated within one year of the date of the avulsion. Any other extension of the bankline into aquatic areas shall be subject to the policies and standards for fill.

16. Structural shoreline stabilization measures shall be coordinated with state and federal agencies to minimize adverse effects on aquatic and shoreland resources and habitats.

17. As a shoreland stabilization and protective measure, bulkheads

shall be designed and constructed to minimize adverse physical effects (i.e., erosion, shoaling, reflection of wave energy or interferences with sediment transport in adjacent shoreline areas) resulting from their placement.

18. Emergency maintenance, for the purpose of making repairs or for the purpose of preventing irreparable harm, injury or damage to persons, property or shoreline stabilization facilities is permitted, not withstanding the other requirements in these standards, but subject to those regulations imposed by the Corps of Engineers and (in Oregon) the Division of State Lands.

19. Revegetated shoreline areas shall be protected from excessive livestock grazing or other activities that would prevent development of effective stabilizing plant cover.

20. Docks and piers shall be built no larger than required for their proposed use.

21. Community dock and pier facilities common to several uses and interests are encouraged. The proliferation of individual single-purpose docks and piers is discouraged.

22. The size and shape of a dock or pier shall be the minimum required for the intended use.

23. Proposals for new docks and piers may be approved only after consideration of alternatives such as mooring buoy, dryland storage, and boat ramps.

### 3.3.6. Filling of Aquatic Areas and Non-tidal Wetlands

This subsection applies to the placement of fill material in the tidal wetlands and waters of the Columbia River Estuary. These policies and standards also apply to fill in nontidal wetlands in shoreland designations that are identified as "significant" nontidal wetlands in Oregon jurisdiction coastal shorelands descriptions (See Section 4.), or by Natural or Conservation designations in Washington jurisdictions.

#### **Policies**

1. New uses in aquatic areas and in shoreland areas especially suited for water-dependent development that are not water-dependent, if permitted, shall not preclude or pose any significant conflicts with existing, proposed or probable future water-dependent uses on the site or in the vicinity.

2. Reduction of surface area or volume of aquatic areas and significant non-tidal wetlands in shoreland areas shall be minimized in the location and design of facilities requiring fill.

3. Construction on piling is preferred over construction on fill.

4. Mitigation may be required for fills (see subsection 3.3.12.).

#### **Standards**

5. Fill in estuarine aquatic areas may be permitted only if all of the following criteria are met:

- (a) If required for navigation or for other water-dependent uses requiring an estuarine location, or if specifically allowed under the applicable aquatic designation; and
- (b) A substantial public benefit is demonstrated; and
- (c) The proposed fill does not unreasonably interfere with public trust rights; and
- (d) Feasible upland alternative locations do not exist; and
- (e) Adverse impacts, as identified in the impact assessment, are minimized.

6. A fill shall cover no more than the minimum necessary to accomplish the proposed use.

7. Aquatic area fills using either dredged material or other easily erodable material shall be surrounded by appropriately stabilized dikes.

8. Aquatic areas shall not be used for disposal of solid waste.

9. Projects involving fill may be approved only if the following alternatives are examined and found to be infeasible:

- (a) Construct some or all of the project on piling;
- (b) Conduct some or all of the proposed activity on existing upland.
- (c) Approve the project at a feasible alternative site where adverse impacts are less significant.

#### **3.3.7. Fish and Wildlife Habitat**

This subsection applies to uses and activities with potential adverse impacts on fish or wildlife habitat, both in Columbia River estuarine aquatic areas and in estuarine shorelands.

#### **Policies**

1. Endangered or threatened species habitat shall be protected from incompatible development.

2. Measures shall be taken protecting nesting, roosting, feeding and

resting areas used by either resident or migratory bird populations.

3. Major nontidal marshes, significant wildlife habitat, coastal headlands, and exceptional aesthetic resources within the Estuary Shorelands Boundary shall be protected. Uses in these areas shall be consistent with the protection of natural values, and may include propagation and selective harvest of forest products, grazing, harvesting, wild crops, and low intensity water-dependent recreation.

#### **Standards**

4. Projects affecting endangered, threatened or sensitive species habitat, as identified by the US Fish and Wildlife Service, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, or Washington Department Wildlife, shall be designed to minimize potential adverse impacts. This shall be accomplished by one or more of the following:

- (a) Soliciting and incorporating agency recommendations into local permit reviews;
- (b) Dedicating and setting aside undeveloped on-site areas for habitat;
- (c) Providing on or off-site compensation for lost or degraded habitat;
- (d) Retaining key habitat features (for example; roosting trees, riparian vegetation, feeding areas).

5. In-water construction activity in aquatic areas shall follow the recommendations of state and federal fisheries agencies with respect to project timing to avoid unnecessary impacts on migratory fish.

6. Uses and activities with the potential for adversely affecting fish and wildlife habitat may be approved only if the following impact mitigation actions are incorporated into the permit where feasible. These impact mitigation actions are listed from highest to lowest priority:

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action;
- (b) Minimizing impacts by limiting the degree or magnitude of an action and its implementation;
- (c) Rectifying the impact by repairing, rehabilitating, restoring the affected environment (this may include removing wetland fills, rehabilitation of a resource use and/or extraction site when its economic life is terminated, etc.);
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations.



7. Projects involving subtidal or intertidal aquatic area fill or intertidal aquatic dredging with the potential for adversely effecting aquatic habitat must provide compensatory mitigation, consistent with the Mitigation and Restoration Plan for the Columbia River Estuary.

### 3.3.8. Fisheries and Aquaculture

The policies and standards in this subsection apply to all projects that could conceivably affect fisheries (either commercial or recreational) or aquaculture in the Columbia River Estuary. This subsection is also applicable to the development of aquaculture facilities and to fisheries enhancement projects.

#### **Policies**

1. Traditional fishing areas shall be protected when dredging, filling, pile driving or when other potentially disruptive in-water activities occur.
2. Sufficient space for present and anticipated needs shall be reserved for the following uses:
  - Fishing vessel moorage;
  - Seafood receiving and processing;
  - Boat repair;
  - Gear storage;
  - Ice making;
  - Cold storage;
  - Other seafood industry support facilities.
3. Increased hatchery production and other fish enhancement efforts shall be supported where feasible, and when consistent with other applicable plan provisions.
4. Aquaculture facility location, design and operation shall minimize adverse impacts on estuarine and shoreland habitat, navigation channels, water quality, and public access points.
5. Existing aquaculture and hatchery facilities and areas identified as having significant aquaculture potential shall be protected from conflicting uses.
6. Aquaculture and hatchery structures shall not interfere with commercial or recreational navigation.

#### **Standards**

7. Water diversion structures or man made spawning channels shall be designed and built to maintain minimum stream flows for aquatic life in affected streams.
8. Water discharged from aquaculture or hatchery facilities shall

comply with state or federal discharge permit conditions.

9. Aquaculture facilities shall be located far enough from sanitary sewer outfalls to avoid potential health hazards.

10. Aquaculture facilities shall be constructed to blend in with and not detract from the aesthetic qualities of the area. In developed areas, views from upland property shall be given consideration in facility design.

11. Water discharge from an aquaculture facility shall meet all federal and state water quality standards and any conditions attached to the waste discharge permit.

12. Operation of a private salmon hatchery requires a permit from the Oregon Department of Fish and Wildlife or the Washington Department of Fisheries.

13. In-water construction activity in aquatic areas shall follow the recommendations of state and federal fisheries agencies with respect to project timing to avoid unnecessary impacts on migratory fish.

14. Commercial fish drifts shall be protected from conflicting in-water activity, including dredging, in-water dredge material disposal, and aquatic area mining and mineral extraction, by coordinating review of such activity with fishery regulatory agencies, fishing organizations, drift captains and drift right owners, and other interested parties.

15. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.

### 3.3.9. Land Transportation Systems

Policies and standards in this subsection are applicable to the maintenance and construction of railroads, roads and bridges in Columbia River estuary shoreland and aquatic areas. Public, as well as private facilities are covered under this subsection. Forest roads, however, are excluded.

#### **Policies**

1. New non-water-dependent uses in aquatic areas or in shoreland areas especially suited for water-dependent development shall not preclude or pose any significant conflicts with existing, proposed or probable future water-dependent uses on the site or in the vicinity.

2. Land transportation systems shall be maintained and improved to support existing urban areas, allow industrial site development and support rural and recreational uses.

3. New land transportation routes shall not be located in aquatic areas or in significant nontidal wetlands in shoreland areas except where bridges are needed, and where no feasible alternative route exists.
4. New land transportation routes shall be located so as not to reduce or downgrade the potential for development of Development Shorelands or Development Aquatic areas.
5. When feasible, new public roads in scenic areas shall provide rest areas, viewpoints and facilities for safe bicycle and pedestrian travel.
6. Construction of new land transportation facilities and maintenance of existing land transportation facilities shall be undertaken in a manner that minimizes expected impacts on aquatic and shoreland estuarine resources.

#### Standards

7. New or relocated land transportation routes shall be designed and sited so as to:
  - (a) Enhance development shoreland areas when possible; and
  - (b) Direct urban expansion toward areas identified as being suitable for development; and
  - (c) Take maximum advantage of the natural topography and cause minimum shoreline disruption; and
  - (d) Preserve or improve public estuary access where existing or potential access sites are identified; and
  - (e) Avoid cutting off high-intensity waterfront use areas or water-dependent development areas from water access.
8. Maintenance and repair of roads and railroads and maintenance and replacement of bridges shall be permitted regardless of the plan designation through which the road or railroad passes, provided:
  - (a) The same alignment is maintained; and
  - (b) The same width is maintained, except that necessary enlargements to meet current safety and engineering standards may be permitted.
9. Fill-supported causeways or bridge approach fills across aquatic areas or across significant nontidal wetlands in shoreland areas shall not be permitted; bridge abutments may, however, be approved.
10. Removal of riparian vegetation along transportation right-of-ways may be permitted in order to maintain clear vision.

### 3.3.10. Log Storage

This subsection establishes policies and standards for the establishment of new, and the expansion of existing, log storage and sorting areas in Columbia River Estuary aquatic and shoreland areas.

#### **Policies**

1. New or expanded aquatic area log storage facilities shall be designed and located so as to minimize potential adverse impacts on aquatic habitat.

#### **Standards**

2. New aquatic log storage areas shall be located such that logs will not go aground during tidal changes or during low flow periods.

3. Proposals for reestablishment of previously used aquatic log storage areas must meet standards applied to new log storage areas, unless such areas have been abandoned for fewer than 36 months.

4. New aquatic log storage areas shall not be located in areas which would conflict with active gillnet fish drifts or with other commercial or recreational fishing activities.

5. New aquatic log storage areas shall be located where water quality degradation will be minimal and where good flushing conditions prevail.

6. Unpaved shoreland log yards underlaid by permeable soils shall have at least four feet of separation between the yard surface and the winter water table.

7. Log storage and sorting facilities in water-dependent development shorelands shall not preclude or conflict with existing or possible future water-dependent uses at the site or in the vicinity, unless the log storage or sorting facility is itself an essential part of a water-dependent facility.

8. New or expanded log storage facilities are subject to an Impact Assessment (Subsection 3.4.1.).

### 3.3.11. Mining and Mineral Extraction

Policies and standards in this subsection are applicable to the extraction of sand, gravel, petroleum products and other minerals from both submerged lands under aquatic areas and from shoreland areas in the Columbia River Estuary. These policies and standards are also applicable to outer continental shelf mineral development support facilities built in the estuary.

#### **Policies**

1. Proposals for aquatic and shoreland area mining may be approved subject to protection of adjacent property and fishery resources from potential adverse impacts, including sedimentation and siltation.
2. Mining operations in aquatic and shoreland areas shall use technology and practices which minimize potential damage to estuarine resources.
3. Mineral extraction or gravel or sand dredging from the estuary may be permitted only when these resources are not otherwise available at an economically feasible upland location.
4. Aquatic area mining or mineral extraction projects may be approved only for the least biologically sensitive areas.
5. Mining and mineral extraction activities shall not be approved in areas of major marshes, significant fish and wildlife habitat, or exceptional aesthetic resources.
6. Wastewater associated with mining shall be handled in a manner that preserves water quality.
7. The surface mining regulations administered by the Washington Department of Natural Resources and by the Oregon Department of Geology and Mineral Industries shall be relied upon with respect to surface mining practices.

#### **Standards**

8. Aquatic area mining and mineral extraction shall only occur in aquatic areas deeper than ten feet below MLLW, where estuarine resource values are low, and when no feasible upland sources exist.
9. Proposed shoreland mining and mineral extraction activities with potential impacts on estuary shoreland and aquatic areas shall provide the local government with a copy of a proposed or approved surface mining plan.
10. Project sponsors proposing estuarine shoreland or aquatic area mining or mineral extraction shall demonstrate that the activity is sited, designed and operated to minimize adverse impacts on the following:
  - (a) Significant fish and wildlife habitat; and
  - (b) Hydraulic characteristics; and
  - (c) Water quality.
11. Petroleum extraction and drilling operations shall not be allowed in aquatic areas. Petroleum may, however, be extracted from beneath aquatic areas using equipment located on shorelands or uplands. Petroleum exploration activities, with the exception of exploratory drilling, may be permitted in estuarine aquatic areas and in estuarine shoreland

areas.

12. Unless part of an approved fill project, spoils and other material removed from aquatic areas shall be subject to Dredged Material Disposal Policies and Standards.

### 3.3.12. Mitigation and Restoration

Policies and standards in this section are applicable to estuarine restoration and mitigation projects on Columbia River Estuary aquatic areas and shorelands.

#### Policies

1. Any dredge or fill activities that are permitted in the Columbia River Estuary intertidal or tidal areas or fill activities in shallow subtidal areas shall be mitigated through project design and/or compensatory mitigation (creation, restoration or enhancement of another area) to ensure that the integrity of the estuary ecosystem is maintained. In Oregon, Comprehensive Plans shall designate and protect specific sites for mitigation which generally correspond to the types and quantity of intertidal area proposed for dredging or filling, or make findings demonstrating that it is not possible to do so.

2. Mitigation for removal and fill in intertidal or tidal areas or fill in shallow subtidal areas of the Columbia River Estuary planning area shall be implemented, to the extent feasible, through the following Mitigation actions:

#### Project Design Mitigation Actions

- a) Avoiding the impact altogether by not taking a certain action or parts of an action;
- b) Minimizing impacts by limiting the degree or magnitude of action and its implementation;
- c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (this would include removing wetland fills, rehabilitation of a resource use and/or extraction site when its economic life is terminated, etc.);
- d) Reducing or eliminating the impact over time by preservation and maintenance operations;

#### Compensatory Mitigation Actions

- e) Creation, restoration, or enhancement of an estuarine area to maintain the functional characteristics and processes of the estuary, such as its natural biological productivity, habitats, and species diversity, unique features and water quality.

Any combination of the above actions may be required to implement mitigation requirements. The compensatory mitigation actions listed in section (e) shall only be implemented after impact avoidance, reduction and rectification techniques have been considered, and there are still unavoidable impacts.

3. The full array of wetland and aquatic area benefits shall be addressed when making mitigation site decisions and when designing mitigation action requirements. The list includes but is not limited to: flood storage and desynchronization, food chain support, passive recreation, shoreline anchoring and water purification functions.
4. All mitigation actions shall be required to begin prior to or concurrent with the associated development action.
5. Developments in low-value diked freshwater nontidal wetlands can be mitigated by treating estuarine restoration or creation as in-kind mitigation actions.
6. If out-of-kind mitigation is found to be the only option, the applicant shall first seek restoration of historically and/or present-day scarce habitat types.
7. All completed mitigation sites shall be adequately buffered from development and other activities to minimize the potential adverse impacts on the mitigation site.
8. No mitigation action shall endanger or obstruct adjacent properties. The potential for present or future endangerment or obstruction shall be determined in advance of the mitigation action. Responsibility shall be determined prior to permit approval.
9. CREST will cooperate with local jurisdictions in the Columbia River Estuary area and state and federal resource agencies in the periodic review of the region's mitigation plan. Reviews shall occur every 4-7 years. The review shall include reexamination of site availability, degree of plan implementation, changed policies and legal requirements and possible new projects that may require mitigation.
10. Estuarine alterations in Washington can be mitigated by actions in Oregon and vice versa if:  

Local and state authorities from both states and federal authorities with statutory responsibility for administering mitigation requirements approve the mitigation site selected and the mitigation action proposed.
11. Mitigation can be considered a permitted or conditional use in any zone, management unit, or environment adopted in a local comprehensive plan or shoreline master plan except, in Oregon, on shorelands designated Water-Dependent Development, agricultural lands under Statewide Planning Goal 3, or forest lands under Statewide Planning Goal 4.
12. Full consideration shall be given to existing resources that are

significant under Oregon Statewide Planning Goal 17, or Resource Category 1 and 2 habitats, when designing a mitigation project that may potentially alter, impair or destroy all or any portion of these resources. The minimum consideration will be to discount existing values from the credit potential of the mitigation action proportional to the value of the significant Goal 17 resource. A goal exception may be required where damage to significant Goal 17 resources is a concern. (Oregon only).

13. Any acquisition strategy for bringing designated mitigation sites (pre or post mitigation action) into public ownership or into ownership of a private nonprofit land trust is encouraged.

14. All mitigation sites designated on public lands shall remain in public ownership.

15. An area in productive use and considered for mitigation purposes shall be evaluated for its present use value and compared with its potential value as a wetland before conversion of the site is acceptable.

16. Adequate mitigation sites shall be designated and protected in the Comprehensive Plan (in Oregon) and Shoreline Master Plans (in Washington) to satisfy anticipated mitigation credit and habitat needs in the Columbia River Estuary.

17. Additional mitigation sites shall be designated by local jurisdictions as the need arises. New designations shall be coordinated with CREST, local governments, state and federal resource agencies. New sites shall be subject to the same policies and standards as sites presently designated.

18. Mitigation sites designated in Wahkiakum County shall be reserved only for development project match-ups that directly benefit the economy of Wahkiakum County.

19. A developer may create, restore or enhance more wetland area than required for immediate development impacts. Subject to federal, state and local agency approval, this "excess mitigation" may be credited against future development by the developer. The reserve wetland area shall not be considered a mitigation bank unless it is acquired and managed by a federal or state land and resource management agency.

#### Mitigation Bank Policies

1. Any area where a mitigation action has taken place and mitigation credits are available for future development and the site is owned and managed by a federal or state land management agency, shall be designated as a mitigation bank. The federal or state agency shall be responsible for administration of a mitigation bank area, throughout the period it serves as a bank.

2. A memorandum of agreement among local, state and federal



authorities shall serve as the implementing instrument establishing the mitigation bank and for continuing management of the bank. Such an agreement is necessary to document the initial conditions of the bank's formation, including the means by which the mitigation bank shall be administered. The agreement shall also detail ownership of the site and include an itemized presentation of project costs, a technical plan outlining the habitat mitigation action, and include the number of mitigation credits available in the bank. A plan for monitoring the mitigation site shall be provided, including the goals, costs, and responsibility of the monitoring program. The agreement shall specify the mechanisms by which mitigation requirements for future estuarine development will be transferred to the bank, the type of activity qualifying for use of the bank, and the means by which proportional mitigation bank development costs will be assessed by development sponsors.

3. Mitigation credits in mitigation banks shall be reserved for use by small scale development projects (5 acres or less of impacted wetland and/or aquatic area).

4. A variety of habitats shall be created whenever possible, such that the opportunity of replacement for wetland resources lost to a variety of development activities is possible. The mitigation bank shall be of sufficient capacity to meet the requirements of a number of expected development projects.

5. Mitigation banks, in Oregon, shall be created by written agreement with the Director of Oregon Division of State Lands (DSL) and shall be administered but not necessarily owned by DSL. Such agreements shall provide the basis for creation and operation of the bank and shall specifically provide for the following:

- a) The exact location of the real property.
- b) Proof of ownership or control, i.e., deed or title report.
- c) The nature and extent of the mitigation action. This analysis shall require information about the site salinity, elevation, wave and current actions, substrate, and other physical and biological characteristics.
- d) How and when the mitigation action shall be performed.
- e) A statement of informed opinion as to what habitat shall result from the action and a statement as to the relative value of each anticipated habitat type.
- f) How the resulting changes shall be monitored and evaluated [OAR 141-85-254 (12, 14)] and what contingencies are planned if goals are not satisfied within a reasonable time period.
- g) How the mitigation bank shall be protected, i.e., dedication, conservation easement, deed transfer, etc.

h) How funding for necessary construction or alteration work and potential remedial action shall be guaranteed, i.e., bonding.

i) The price that may be charged for credits from the bank.

6. Applicants for removal and fill permits requiring mitigation are not obligated, or automatically entitled, to use an existing mitigation bank to meet the mitigation needs of any project. Permit applicants shall negotiate directly with the owner of the bank to secure the right to use the bank.

#### Restoration Policies for Wetlands and Aquatic Areas

1. Restoration of tidal and nontidal wetlands in the Columbia River Estuary area may be done either as a mitigation action or as an action outside of the context of mitigation.

2. Potential restoration sites (areas suitable for restoration but not matched with a development action) may be designated as mitigation sites until they are identified for restoration outside of the context of mitigation. At this time, they shall be designated as restoration sites.

3. All restoration projects shall serve to revitalize, return, replace or otherwise improve the wetland and aquatic ecosystems in the Columbia River Estuary area. Examples include restoration of natural biological productivity, fish and wildlife habitat, aesthetic or historic resources that have been diminished or lost due to past alterations, activities, or catastrophic events. In selecting projects, priority shall be given to those projects which provide substantial public benefits and which restore those wetland and aquatic habitat types, resources, or amenities which are in shortest supply compared to past abundance.

4. The following framework for restoration implementation is recommended for the Columbia River Estuary:

a) To develop and provide educational materials for landowners explaining the benefits of natural area protection and various options for restoring land to natural conditions and protecting the restored land.

b) To establish an incentive system in the Columbia River Estuary area whereby landowners can effectively utilize a variety of options for restoration and protection of their land.

c) To identify landowners with economically marginal production land (e.g., forest or crop production), that was historically wetland, and to inform them of the incentive-oriented restoration system being devised and encourage their participation.

d) To differentiate between areas that are mitigation site candidates as opposed to restoration site candidates. Any potential restoration that is not matched with a proposed

development can be a candidate.

5. The following techniques are suggested as potential methods to establish a wetland restoration and protection incentive system:
  - a) Development of effective acquisition power through private nonprofit land trusts and federal and state grants (acquisition may be through sale, trade or land donations). Public ownership is encouraged.
  - b) Protection through restrictions while landowners retain title to the land, i.e., conservation easements, mutual covenants, deed restrictions and leases.
  - c) Provide tax incentives for landowners that allow restoration to take place on their land.
  - d) Deed restrictions, wildlife easements or fee acquisition on Farmers Home Administration farm foreclosure inventory lands.
6. Restoration actions that flood farm properties, forest lands, sites designated Water-Dependent Development and significant resources under Oregon Statewide Planning Goal 17 shall require full consideration to trade-offs associated with each action.
7. After a restoration takes place the local jurisdiction shall amend its plan and implement a zone change to reflect the aquatic natural character of the created wetland and/or aquatic area.
8. Restoration of economically marginal and unused low-lying diked areas to estuarine wetland shall be encouraged; active restorations to provide potential for diverse habitat (e.g., mudflat and marsh) as well as passive restorations are encouraged. Except through public condemnation procedures, removal of dikes or excavation on private lands shall not occur without consent of the landowner.

#### Restoration Standards for Wetlands and Aquatic Areas

1. In Oregon, an exception to Statewide Planning Goal 3 or 4 shall be required to implement restoration actions on agricultural land or forest land.
2. In Oregon, an exception shall be required to implement restoration actions in areas designated for Water-Dependent Development and areas where restoration may deleteriously affect resources that are significant under Oregon Statewide Planning Goal 17.

#### Long Term Wetland and Aquatic Area Mitigation and Restoration Policies

1. Federal and state resource agencies shall be requested to intensify existing programs to identify Resource Categories of wetlands and

section 404 wetlands in the Columbia River Estuary area with the purpose being to give greater certainty to developers regarding available development sites and potential mitigation requirements. The net result shall be greater certainty for developers and a more streamlined permit process.

2. CREST shall make an effort to develop a program to identify and assess the relative values of the nontidal wetlands in the CREST planning jurisdiction. This inventory effort shall provide baseline data that can be used to give greater certainty to development interests regarding site potential for development. It will serve to help alleviate the problem of lengthy and costly after the fact permits and restoration orders. It will also serve to give greater certainty to appropriate mitigation and dredge disposal site selection.

3. A method of quantifying enhancement credits for mitigation shall be determined.

4. A mechanism through which a transfer of development rights can occur shall be researched and, if feasible, installed into local planning ordinances.

5. A system shall be devised whereby wetland impacts that are allowed under a regional or nationwide permit and that do not require a permit procedure to be followed, shall be reported to the local government so that an accurate record of cumulative wetland impacts can be maintained.

#### Restoration Policies for Resources Other Than Wetlands and Aquatic Areas

1. Consideration shall be given to restoring water circulation in historically shoaled areas. Circulation enhancements must outweigh any potential damages to wetlands before they are implemented.

2. Old piling, navigational structures, and buildings that are a hazard to navigation and contribute to excessive shoaling, or pose a threat to life or property shall be removed. Prior to removal, the costs and benefits associated with removal shall be evaluated. Factors requiring consideration include:

- o Potential erosion or sedimentation problems that may result from removal;
- o The structure's habitat value and probable longevity; and
- o The structure's historic and scenic values.

3. Restoration of riparian vegetation around wetlands and waterways in the Columbia River Estuary planning area is a high priority. Protection of these areas shall be implemented using various strategies, i.e., zoning, acquisitions, easements, transfer of development rights (if possible), etc.

4. Shoreland and wetland areas that have had the vegetation cover removed by development activities shall be revegetated to the extent practicable with wildlife value, aesthetics and erosion control being the primary objectives.

#### STANDARDS

1. Any dredge or fill activities that are permitted in the Columbia River Estuary intertidal or tidal areas or fill activities in shallow subtidal areas shall be mitigated through project design and/or compensatory mitigation (creation, restoration or enhancement of another area) to ensure that the integrity of the estuary ecosystem is maintained. In Oregon, Comprehensive Plans shall designate and protect specific sites for mitigation which generally correspond to the types and quantity of intertidal area proposed for dredging or filling, or make findings demonstrating that it is not possible to do so.

2. Mitigation for removal and fill in the Columbia River Estuary intertidal areas or fill in shallow subtidal areas shall be implemented, to the extent feasible, through the following Mitigation actions:

##### Project Design Mitigation Actions

- a) Avoiding the impact altogether by not taking a certain action or parts of an action;
- b) Minimizing impacts by limiting the degree or magnitude of action and its implementation;
- c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment (this would include removing wetland fills, rehabilitation of a resource use and/or extraction site when its economic life is terminated, etc.);
- d) Reducing or eliminating the impact over time by preservation and maintenance operations;

##### Compensatory Mitigation Actions

- e) Creation, restoration, or enhancement of an estuarine area to maintain the functional characteristics and processes of the estuary, such as its natural biological productivity, habitats, and species diversity, unique features and water quality.

Any combination of the above actions may be required to implement mitigation requirements. The compensatory mitigation actions listed in (e) shall only be considered when, after consideration of impact avoidance, reduction or rectification, there are still unavoidable impacts.

3. If any of the compensatory mitigation actions are required, the local government shall request that the U. S. Fish and Wildlife Service make a Resource Category determination for the site proposed for

development. The classification shall be listed on the permit application and review notice. If the area subject to impact is in a Resource Category 1 site, it shall be protected, if it is in a Resource Category 2 or lower (4 = lowest), the following sequence of mitigation options shall be considered:

- o In-Kind/On-Site
- o In-Kind/Off-Site
- o Out-of-Kind/On-Site
- o Out-of-Kind/Off-Site

The following list summarizes the mitigation goal for each resource category:

a) Resource Category 1:

Habitat to be impacted is of high value for evaluation species and is unique and irreplaceable on a national basis or in the Columbia River Estuary area.

Mitigation Goal: No loss of existing habitat value.

b) Resource Category 2:

Habitat to be impacted is of high value for evaluation species and is relatively scarce or becoming scarce on a national basis or in the Columbia River Estuary area.

Mitigation Goal: No net loss of in-kind habitat value.

c) Resource Category 3:

Habitat to be impacted is of high to medium value for evaluation species and is relatively abundant on a national basis.

Mitigation Goal: No net loss of habitat value while minimizing loss of in-kind habitat value.

d) Resource Category 4:

Habitat to be impacted is of medium to low value for evaluation species.

Mitigation Goal: Minimize loss of habitat value.

4. All initial mitigation site work shall be reviewed against predesignated performance specifications, i.e., starting date, a negotiated completion date, grade specifications, area and elevation specifications of dike removal, channel specifications, seeding or planting specifications, etc. Any specifications not addressed or satisfied shall be cause to require remedial follow-up measures to satisfy the performance specification(s). Remedial work shall also be required for dredge or

fill impacts not specified in the permit.

5. All mitigation actions shall be required to begin prior to or concurrent with the associated development action.

6. All mitigation permit requirements shall address specific mitigation goals, and to the extent practicable, measurable objectives (e.g., the amount of vegetative cover that will be established in a specific area over a specified time period). These goals and objectives shall be determined by the local government in coordination with state and federal resource agencies. The purpose of the goals and objectives is to provide a standard by which to measure the success of a particular mitigation action. The permit shall not be approved until determination has been made that the goal and objective statements are satisfactory. "Satisfactory" means that post-mitigation monitoring can use the goal and objective statements on the permits to judge the success of the projects.

7. Post-mitigation monitoring of project design and compensatory mitigation sites shall be required over a 2-5 year time period, depending on the size and complexity of the mitigation project.

- a. Local governments, in cooperation with state and federal resource agencies, shall design and implement the monitoring.
- b. Developer accountability requirements shall be based on anticipated financial and environmental risk factors.
- c. A bond, or any legal mechanism that serves as a bond, shall be required to hold the developer accountable to remedial follow-up requirements.
- d. Potential remedial follow-up actions shall be identified in a well structured contingency plan. The contingency plan shall be required as a condition of permit approval.
- e. The developer shall not be responsible for project problems not addressed in the contingency plan nor for any expenses over the amount estimated in the contingency plan.
- f. Any portion of monies held and not used for remedial work shall be refunded to the developer.
- g. A waiver of the 2-5 year monitoring requirement shall be granted if, at any time during the 2-5 year period, the project is judged successful.
- h. If a mitigation project fails to satisfy the original goals and objectives after the designated time period, and the developer has met all the site design and contingency plan requirements, then the developer is not responsible for remedial action. However monitoring may still be required up to a predetermined time period to help agencies determine workable strategies for future mitigation efforts.

- i. The contingency plan shall include statements of potential courses of action, or corrective measures to be taken, in the event of sub-optimal project performance (based on project goals and objectives).
8. For nontidal wetlands in Oregon, once a compensatory mitigation action is required, local governments shall determine habitat trade requirements in coordination with appropriate state and federal agencies. Mitigation requirements shall be made on a case by case basis using determinations made by these agencies.
9. For estuarine and nontidal wetlands in Washington, once a compensatory mitigation action is required, local governments shall determine baseline habitat carrying capacity in coordination with appropriate state and federal agencies. Mitigation requirements shall be made on a case by case basis using the determinations made by these agencies.
10. In Oregon, removal and fill actions exempt from estuarine mitigation requirements include:
  - a) Removal or fill of less than 50 cubic yards of material;
  - b) Filling for repair and maintenance of existing functional dikes where there is negligible physical or biological damage to tidal marsh or intertidal area;
  - c) Riprap to allow protection of existing bank line with clean, durable material provided that the need for riprap protection is demonstrated and that this need cannot be met with natural vegetation, and no appreciable increase in upland occurs;
  - d) Filling for repair and maintenance of existing roads where there is negligible physical or biological damage to tidal marsh or intertidal areas;
  - e) Dredging or filling required as part of an estuarine resource creation, restoration, or enhancement project agreed to by local, state, and federal agencies; and
  - f) Maintenance dredging.
  - g) Any proposed alteration that would have negligible adverse physical or biological impact on the estuarine resources.
11. Actions not considered as mitigation in Oregon or Washington include:
  - a) Conversion of an existing wetland type to another wetland type as mitigation for impacts on another wetland shall not be allowed. Diked nontidal wetlands with low wildlife value can be discounted and restored to tidal influence as mitigation for impacts in diked nontidal wetlands. Also, enhancement of an existing wetland can be considered mitigation for impacts



in another wetland;

- b) Transfer of ownership of existing wetlands to public ownership.
- c) Dedication of existing wetlands for natural uses;
- d) Provision of funds for research; or
- e) Monetary compensation for lost wetlands.

12. The following criteria shall be considered when selecting and including potential mitigation sites in the Columbia River Estuary Mitigation Plan (not in order of priority):

- a) Proximity to potential development sites.
- b) Opportunity to create or restore habitat conditions similar to those at the impacted sites or historically and presently scarce habitat types.
- c) Character of potential sites (e.g., low habitat value and no conflicting uses).
- d) Potential for protection through zoning.
- e) Amount of new dike requirements

13. Mitigation site designations not established in the Plan shall be made using criteria itemized in Standard 14. In addition, sites selected shall have enough area and/or credits to accommodate the mitigation requirement as stipulated by:

- a) In Oregon:
  - o The Oregon Division of State Lands relative value trade formula (OAR 141-85-256) for Oregon's portion of the Columbia River Estuary.
  - o The Habitat Evaluation Procedures, Adamas Model, or professional judgment of federal and state wildlife biologists for Oregon's nontidal freshwater wetlands.
- b) In Washington:
  - o For estuarine and nontidal wetlands, once a compensatory mitigation action is required, local governments shall determine baseline habitat carrying capacity in coordination with appropriate state and federal agencies. Mitigation requirements shall be made on a case by case basis using the determinations made by these agencies.

14. The following approach shall be used to protect sites selected for

compensatory mitigation actions:

- a) All mitigation sites shall be designated in local Comprehensive Plans in Oregon and Shoreline Master Programs in Washington.
- b) All sites are classified under one of three priorities (based on need) and one of four levels of protection (based on need and landowner concerns):

15. For mitigation sites on Exclusive Farm Use land (in Oregon), farm related structures valued at \$ 5,000 or less shall be considered exempt from permit requirements.

16. A Plan amendment shall be required to remove a Priority 1 mitigation site from the mitigation overlay. A Plan amendment shall require a demonstration that there is no longer a need for the site or that a suitable alternative mitigation site has been designated and protected.

17. A Priority 2 site shall be totally removed from the mitigation overlay if the landowner proposes a development that would preclude its use for mitigation and, 30 days after the permit application has been circulated, a negotiated agreement to sell the land, or certain landownership rights, for mitigation use has not been made. The negotiation shall be between the landowner and any interested buyer. The site shall not be removed from the overlay until the development is completed.

18. A Priority 2 site shall be partially removed from the mitigation overlay if the landowner proposes a development that would partially preclude its use for mitigation and, 30 days after the permit application has been circulated, a negotiated agreement to sell the land, or certain landownership rights, for mitigation use has not been made. The negotiation shall be between the landowner and any interested buyer. The partial removal shall not take place until the development is completed.

19. The local jurisdiction shall make the determination of whether a development will preclude all or some of the potential use of the site for mitigation purposes.

20. If the landowner is a public entity, and the proposed mitigation site is in a protected zone and managed under protection oriented directives, a protection requirement shall not be imposed on the site.

21. After a mitigation action takes place, the local jurisdiction shall amend its plan and implement a zone change to reflect the aquatic natural character of the created wetland and/or aquatic area.

22. Private landowners shall be compensated, by the developer, with payment equal to fair market value for land used for mitigation actions on their ownerships.

23. The developer implementing a mitigation action shall be responsible for all costs associated with the mitigation project.

<b>A. Priority</b>	<b>Need</b>	<b>Level</b>	<b>Protection</b>
1	High	1	
Matched with Mediated Development	Landowner not concerned about restrictions		Uses that preclude use of the site for mitigation purposes (e.g., substantial topographic alterations or alterations or structural improvements) are not allowed without a plan amendment.
<b>B. Priority</b>	<b>Need</b>	<b>Level</b>	<b>Protection</b>
1	High	2	
Matched with Mediated Development	Landowner concerned about property restrictions		Substantial topographic alterations and structural improvements allowed under a conditional use permit. Conditions are (1) no deviation from conditions allowed under existing underlay zone (e.g., EFU) and (2) if diked, demonstration that a predetermined amount of dike frontage and contiguous diked area be retained for mitigation purposes. If upland, then demonstration a predetermined amount of contiguous area is available for excavation to allow tidal influence or capable of being inundated through some water level control procedure.
<b>C. Priority</b>	<b>Need</b>	<b>Level</b>	<b>Protection</b>
2	Medium	3	
Matched with non-mediated development			A 30 day freeze on permit applications to give public agencies time to review potential effects on mitigation use and current need for mitigation use at the site.
<b>D. Priority</b>	<b>Need</b>	<b>Level</b>	<b>Protection</b>
3	Low	4	
Not matched with a development			No restrictions, listed for inventory purposes only.

### 3.3.13. Public Access to the Estuary and its Shoreline

Policies and standards in this subsection apply to all uses and activities in Columbia River Estuary shoreland and aquatic areas which directly or indirectly affect public access. "Public access" is used broadly here to include direct physical access to estuary aquatic areas (boat ramps, for example), aesthetic access (viewing opportunities, for example), and other facilities that provide some degree of public access to Columbia River Estuary shorelands and aquatic areas.

#### **Policies**

1. Existing public ownerships, rights-of-way, and similar public easements in estuary shorelands which provide access to or along the estuary shall be retained or replaced if sold, exchanged or transferred. Rights-of-way may be vacated to permit redevelopment of shoreland areas provided public access across the affected site is retained.
2. Public access in urban areas shall be preserved and enhanced through waterfront restoration and public facilities construction, and other actions consistent with local public access plans.
3. Public access in rural areas shall be preserved and enhanced through development of trails, boat ramps and other actions consistent with local public access plans.
4. Proposed major shoreline developments shall not, individually or cumulatively, exclude the public from shoreline access to areas traditionally used for fishing, hunting or other shoreline activities.
5. Special consideration shall be given toward making the estuary accessible for the physically handicapped or disabled.

#### **Standards**

6. Projects to improve public access shall be designed to assure that adjacent privately owned shoreland is protected from public encroachment.
7. Oregon jurisdictions will develop and implement programs for increasing public access.

### 3.3.14. Recreation and Tourism

Policies and standards in this subsection are applicable to recreational and tourist-oriented facilities in Columbia River estuary shoreland and aquatic areas.

#### **Policies**

1. New non-water-dependent uses in aquatic areas or in shoreland areas especially suited for water-dependent development shall not preclude or

pose any significant conflicts with existing, proposed or probable future water-dependent uses on the site or in the vicinity.

2. Recreation uses in waterfront areas shall take maximum advantage of their proximity to the water by providing water access points, waterfront viewing areas, and structures visually compatible with the waterfront.

### **Standards**

3. Off-street parking may only be located over an aquatic area if all of the following conditions are met:

- (a) Parking will be on an existing pile-supported structure; and
- (b) Suitable shoreland areas are not available; and
- (c) The amount of aquatic area committed to parking is minimized; and
- (d) The aquatic area is in a Development designation.

4. New or expanded recreation developments shall be designed to minimize adverse effects on surface and ground water quality. Adverse effects of storm run-off from parking lots shall be minimized.

5. New or expanded recreational developments shall be designed and located so as not to unduly interfere with adjacent land uses.

### **3.3.15. Residential, Commercial and Industrial Development**

The policies and standards in this subsection are applicable to construction or expansion of residential, commercial or industrial facilities in Columbia River Estuary shoreland and aquatic areas. Within the context of this subsection, residential uses include single and multi-family structures, mobile homes, and floating residences (subject to an exception to Oregon Statewide Planning Goal 16 in Oregon). Duck shacks, recreational vehicles, hotels, motels and bed-and-breakfast facilities are not considered residential structures for purposes of this subsection. Commercial structures and uses include all retail or wholesale storage, service or sales facilities and uses, whether water-dependent, water-related, or non-dependent, non-related. Industrial uses and activities include facilities for fabrication, assembly, and processing, whether water-dependent, water-related or non-dependent non-related.

### **Policies**

1. New uses in aquatic areas and in shoreland areas especially suited for water-dependent development that are not water-dependent, if permitted, shall not preclude or pose any significant conflicts with existing, proposed or probable future water-dependent uses on the site or in the

vicinity.

2. Where non-dependent, non-related residential, commercial or industrial development exists on shorelands designated for water-dependent development, transition of shorelands to water-dependent or water-related uses is encouraged.

### Standards

3. Sign placement shall not impair views of water areas. Signs shall be constructed against existing buildings whenever feasible. Off-premise outdoor advertising shall not be allowed in aquatic areas.

4. Off-street parking may only be located over an aquatic area if all of the following conditions are met:

- (a) Parking will be on an existing pile-supported structure, and
- (b) Suitable shoreland areas are not available, and
- (c) The amount of aquatic area committed to parking is minimized; and
- (d) The aquatic area is in a Development designation.

5. Joint use of parking, moorage and other commercial support facility is encouraged where feasible and where consistent with local ordinance requirements.

6. Uses on floating structures shall be located in areas protected from currents and wave action, and shall not rest on the bottom during low tidal cycles or low-flow periods.

7. Aquatic areas or significant non-tidal wetlands in shoreland areas may not be used to compute the lot area or density for residential development in shoreland areas.

8. Where groundwater is or may be used as a water supply, the groundwater table shall not be significantly lowered by drainage facilities, or be affected by salt water intrusion due to groundwater mining.

9. Fill in estuarine aquatic areas or in significant non-tidal wetlands in shoreland areas shall not be permitted for residential uses (Oregon only).

10. Piling or dolphin installation, structural shoreline stabilization, and other structures not involving dredge or fill, but which could alter the estuary may be allowed only if all of the following criteria are met:

- (a) A substantial public benefit is demonstrated; and
- (b) The proposed use does not unreasonably interfere with public trust rights; and

- (c) Feasible alternative upland locations do not exist; and
- (d) Potential adverse impacts, as identified in the impact assessment, are minimized.

### 3.3.16. Shallow-Draft Ports and Marinas

The policies and standards in this subsection apply to development of new marinas and improvement of existing marinas in aquatic areas of the Columbia River Estuary. Also covered are adjacent shoreland support facilities that are in conjunction with or incidental to the marina. Included under this subsection's coverage are both public and private marinas for either recreational, charter or commercial shallow draft vessels.

#### **Policies**

1. Proliferation of individual single-purpose docks and moorages is discouraged. Public or commercial multi-vessel moorage is preferred.
2. Navigational access to the estuary and its tributaries shall be maintained. Peripheral channels, streams and sloughs shall not be closed to navigation. Necessary maintenance dredging for traditional moorage areas shall be allowed, subject to the requirements of the designation, state and federal permits, and local plan and ordinance provisions.

#### **Standards**

3. New marinas may be approved only when existing marinas are inadequate with respect to location, support services or size; or cannot expand to meet area moorage needs.
4. New marinas shall be located in or adjacent to areas of extensive boat usage, and in areas capable of providing necessary support services (including street access, upland parking, water, electricity and waste disposal).
5. The feasibility of upland boat storage shall be evaluated concurrent with proposals for new or expanded marina facilities.
6. Marina development and expansion may require some filling and dredging of presently undeveloped areas. Significant aquatic and shorelands resources shall be protected from preventable adverse impacts in the design, construction, and maintenance of marina facilities.
7. Marina development requiring filling or dredging in estuarine aquatic areas may be permitted only if all of the following criteria are met:
  - (a) If required for navigation or for other water-dependent uses requiring an estuarine location, or if specifically allowed under the applicable aquatic designation; and

- (b) A substantial public benefit is demonstrated; and
  - (c) The proposed dredging or filling does not unreasonably interfere with public trust rights; and
  - (d) Feasible upland alternative sites do not exist; and
  - (e) Adverse impacts are minimized.
8. New, expanded or renovated marinas shall be designed to assure adequate water circulation and flushing.
9. New or expanded marinas shall provide facilities for emptying holding tanks so that these wastes are not placed in the river.
10. Covered moorages may be permitted in marinas subject to the following requirements:
- (a) Information is provided on existing water quality and habitat conditions in the aquatic area proposed for the covered moorage; and
  - (b) Data on existing aquatic vegetation, and an analysis of the proposed covered moorages' impact on aquatic vegetation are provided; and
  - (c) Information is provided on light penetration, both with and without the proposed covered moorage; and
  - (d) No more than 20% of the marina's aquatic surface is occupied by the covered moorages.
11. New or expanded marina fuel docks shall maintain on-site equipment for the containment of spilled fuel.
12. Floating docks in marinas shall be located such that they do not rest on the bottom during low tides.
13. New individual docks outside of marinas may only be built when it is shown that existing marinas cannot reasonably accommodate the proposed use.
14. The size and shape of docks and piers in marinas shall be limited to that required for the intended use.
15. Alternatives to new docks and piers, such as mooring buoys, dry land storage and launching ramps, shall be investigated and considered before new docks are permitted in a marina.

### 3.3.17. Shoreland Hazard Areas

The policies and standards in this subsection apply to development



in Columbia River Estuary shoreland areas with identified hazards to development. These hazards are identified in area and subarea plans (Section 4.), and include areas susceptible to erosion, soil movement, and flooding.

#### **Policies**

1. Development proposed for identified shoreland hazard areas is generally discouraged. All new and replacement development in shoreland hazard areas shall be protected from the hazard.

#### **Standards**

2. Proposed shoreland area development shall be evaluated prior to construction to assure that new hazards are not created or existing hazards are not worsened on adjacent property.

### **3.3.18. Significant Areas**

The policies and standards in this subsection are intended to protect certain shoreland and aquatic resources with estuary-wide significance. Significant shoreland resources are identified as such in area and subarea plans (Section 4.). Significant aquatic resources are found in Natural Aquatic areas. This subsection applies only to activities and uses that potentially affect significant shoreland or aquatic resources. Other resources without estuary-wide significance are not covered by this subsection.

#### **Policies**

1. Significant estuarine aquatic and shoreland resources shall be protected from degradation or destruction by conflicting uses and activities.
2. Major marshes, significant wildlife habitat, and exceptional aesthetic resources shall be protected. Uses in these areas may include selective harvesting of forest products consistent with the Oregon Forest Practices Act, grazing, harvesting, wild crops, and low-intensity water-dependent recreation.

#### **Standards**

3. Temporary removal of riparian vegetation may be permitted in conjunction with a water-dependent use where direct access to the water is required for construction or for a temporary use. Permanent removal of riparian vegetation may be approved for a water-dependent project. Riparian vegetation removed for these reasons must be replaced upon project completion.
4. Permanent removal of riparian vegetation may be permitted along transportation right-of-ways for purposes of maintaining clear vision maintaining clear vision. Riparian vegetation that threatens the

stability of flood control dikes may be removed.

5. Except as provided for in Standards 3 and 4, riparian vegetation shall not be removed.

6. Public access to significant scenic areas shall be provided in a manner consistent with the preservation of the scenic area and other significant resources.

7. Tidedegated sloughs and drainage ditches identified as having significant aquatic habitat value, significant riparian vegetation, or other significant shoreland resource value may be maintained with respect to depth, but their bankline location and configuration may not be altered, unless part of an approved fill or shoreline stabilization project.

8. A setback of 25 feet from significant riparian vegetation shall be required for all new structures.

#### 3.3.19. Water Quality Maintenance

The policies and standards in this subsection are intended to help protect and enhance the quality of water in the Columbia River Estuary. Impacts on water quality in aquatic areas and in tidedegated sloughs in shoreland areas are covered.

##### **Policies**

1. Non-point source water pollutants from forest lands, roads, agricultural lands, streambank erosion and urban runoff shall be controlled by state Section 208 water quality programs, in Oregon, the Oregon Forest Practices Act and its Administrative Rules or, in Washington, the Washington Forest Practices Act and its Administrative Code, and Soil Conservation Service programs.

2. New untreated waste discharges into tributary streams, enclosed bays and sloughs shall not be permitted.

3. Petroleum spill containment and clean-up equipment should be located in the estuary area. This equipment should be capable of controlling a large spill in all areas of the estuary.

##### **Standards**

4. New and expanded marinas shall provide facilities for emptying holding tanks so that these wastes are not placed in the river.

5. Thermal effluents shall be cooled before they are returned to the estuary.

6. The potential adverse impacts on water quality of dredging, fill, in-water dredged material disposal, in-water log storage, water intake or withdrawal, and slip or marina development will be assessed during

permit review. Parameters to be addressed include:

- Turbidity
- Dissolved oxygen
- Biochemical oxygen demand
- Contaminated sediments
- Salinity
- Water temperature
- Flushing

7. New or expanded marine fuel docks must provide on-site equipment for the containment of fuel spills.

8. New point-source waste water discharges into the Columbia River will be controlled through the National Pollution Discharge Elimination System (NPDES) permit program.

9. Estuarine Aquatic area pesticide application will be controlled by the State Department of Agriculture and, in Oregon, the Department of Environmental Quality and, in Washington, the Department of Ecology.

### 3.3.20. Water-Dependent Development Areas

Policies and standards in this subsection are applicable only to those Columbia River Estuary Shorelands that are designated as Water-Dependent Development Shorelands. The purpose of these policies and standards is to assure that adequate sites are available for water-dependent uses.

#### **Policies**

1. Shorelands especially suited for water-dependent uses shall be protected for water-dependent uses and for other uses as provided for in the designation (Subsection 2.3.9.).

2. Shorelands especially suited for water-dependent recreational, commercial and industrial uses shall be placed in a Water-dependent Development Shorelands designation. Some factors which contribute to this special suitability are:

- (a) Deep water close to shore;
- (b) Supporting land transport facilities suitable for ship and barge facilities;
- (c) Potential for aquaculture;
- (d) Protected areas subject to scour which would require little dredging for use as marinas;
- (e) Potential for recreational utilization of the estuary or riparian areas.

### 3.3.21. Implementation

The policies in this section are intended to assure consistent region-wide implementation of the policies and standards in Section 3.3.1. through 3.3.20.

#### Policies

1. Prepermit application meetings and site visits shall be encouraged.
2. Initial site visit shall be structured such that key issues will be addressed and consensus, to the degree possible, is established on each issue. This will require a structured format listing goals, objectives, and specific activities.
3. The regional policies and standards in sections 3.3.1. through 3.3.20. are part of a regional plan for the Columbia River Estuary. Amendments must be coordinated with the Columbia River Estuary Study Taskforce (CREST).
4. CREST will provide planning assistance to member agencies upon request to and approval by the CREST Council, review local comprehensive plans and shoreline management master programs, and make recommendations which will result in coordination and conformance with the Columbia River Estuary Regional Management Plan.
5. CREST will provide technical information and assistance to members and other agencies for Columbia River Estuary Regional Management Plan implementation.
6. CREST members will maintain the coordinated Regional Management Plan by mutually adopting Plan amendments during scheduled Plan updates.

### 3.4. ENVIRONMENTAL ASSESSMENT

This section describes some of the additional substantive and procedural requirements associated with several of the uses and activities in the permitted use lists (Subsection 2.3.).

#### 3.4.1. Oregon Jurisdiction Impact Assessment

Oregon Statewide Planning Goal 16, dealing with estuarine resources, requires that actions which would potentially alter the estuarine ecosystem must be preceded by an assessment of potential impacts. The Impact Assessment need not be lengthy and complex, but it should enable reviewers to gain a clear understanding of the impacts expected. The following uses and activities, in addition to those so indicated on the use lists, all require an Impact Assessment at the time a local permit is reviewed:

Dredging;  
Aquatic area fill;  
In-water structures;  
Riprap;  
New in-water log storage areas;  
Water intake pipes;  
In-water dredged material disposal;  
Beach nourishment;  
Other uses or activities which could affect estuarine physical or biological resources; and  
Uses or activities that require a Resource Capability Determination.

Information needed to complete the Impact Assessment may be obtained from sources other than the permit application, such as a Federal Environmental Impact Statement. An assessment of impacts of aquatic area pesticide application shall be provided by the Oregon Department of Agriculture and the Oregon Department of Environmental Quality.

A complete Impact Assessment includes the following information:

1. Aquatic life forms and habitat, including information on both the extent of and impacts on: habitat type and use, species present (including threatened or endangered species), seasonal abundance, sediments, and vegetation.
2. Shoreland life forms and habitat, including information on both the extent of and impacts on: habitat type and use, species present, (including threatened or endangered species), seasonal abundance, soil types and characteristics, and vegetation present.
3. Water quality, including information on: sedimentation and turbidity, dissolved oxygen, biochemical oxygen demand, contaminated sediments, salinity, water temperatures, and expected changes due to the proposed use or activity.
4. Hydraulic characteristics, including information on: water circulation, shoaling patterns, potential for erosion or accretion in adjacent areas, changes in flood levels, flushing capacity, and water flow rates.
5. Air quality, including information on quantities of particulates and expected airborne pollutants.
6. Public access to the estuary and shoreline, including information on: proximity to publicly-owned shorelands and public street ends; effect on public boat launches, marinas and docks; and impact on inventoried public access opportunities.
7. Navigation, including information on: distance from navigation channels, turning basins and anchorages; proximity to range markers.
8. Demonstration that proposed structures or devices are properly engineered.

9. Demonstration that the project's potential public benefits will equal or exceed expected adverse impacts.

10. Demonstration that non-water dependent uses will not preempt existing or future water-dependent utilization of the area.

12. Determination of methods for mitigation and accommodation of the proposed development, based on items (1) through (10) above, in order to avoid or minimize preventable adverse impacts.

Based on the information and analysis in (1) through (11) above, one of the following four conclusions shall be reached:

- The proposed uses and activities do not represent a potential degradation or reduction of estuarine resource.
- The proposed uses and activities represent a potential degradation or reduction of estuarine resources. The impact assessment identifies reasonable alterations or conditions that will eliminate or minimize to an acceptable level expected adverse impacts.
- The proposed uses and activities will result in unacceptable losses. The proposed development represents irreversible changes and actions and unacceptable degradation or reduction of estuarine resource properties will result.
- Available information is insufficient for predicting and evaluating potential impacts. More information is needed before the project can be approved.

#### 3.4.2. Oregon Jurisdiction Resource Capability Determination

Some of the uses and activities listed in the use lists (Subsection 2.3.) may only be approved when consistent with the resource capabilities of the area and the purposes of the designation. This section describes procedures for making this determination. A completed resource capability determination consists of three elements.

1. Identification of the affected area's designation, and its purpose.
2. Identification of the types and extent of estuarine resources present and expected adverse impacts. This information is included in the impact assessment.
3. A determination of whether the use or activity is consistent with the resource capabilities of the affected designation. A use or activity is consistent with the resource capabilities of the area when either the impacts of the use on estuarine species, habitats, biological productivity, and water quality are not significant or that the resources of the area are able to assimilate the use and activity and their effects and continue to function in a manner which either:

- (a) In Natural Aquatic designations, protects significant wildlife habitats, natural biological productivity, and values for scientific research and education; or
- (b) In Conservation Aquatic designations, conserves long-term renewable resources, natural biological productivity, recreation and aesthetic values and aquaculture.

For temporary alterations, the resource capability determination must also include:

- 4. Determination that the short-term damage to estuary and shoreland resources is consistent with the resource capabilities of the area; and
- 5. Determination that the area and affected resources can be restored to their original condition.

#### 3.4.3. Washington Jurisdiction State Environmental Policy Act (SEPA) Checklist

Washington's State Environmental Policy Act (RCW 43.21C) requires that certain types of projects may be approved only upon review of an Environmental Impact Statement (EIS). EIS details, and the types of projects they are applicable to, are too complex to describe here. They are described fully in the SEPA administrative rules (WAC 197-11). The elements of a completed EIS are listed below, in outline format:

- (1) Natural Environment
  - (a) Earth
    - (i) Geology
    - (ii) Soils
    - (iii) Topography
    - (iv) Unique Physical Features
    - (v) Erosion/accretion
  - (b) Air
    - (i) Air Quality
    - (ii) Odor
    - (iii) Climate
  - (c) Water
    - (i) Surfacewater movement/quantity/quality

- (ii) Runoff/absorption
- (iii) Floods
- (iv) Groundwater movement/quantity/quality
- (v) Public water supplies
- (d) Plants and Animals
  - (i) Habitat, numbers, diversity
  - (ii) Unique species
  - (iii) Migration routes
- (e) Energy and Natural Resources
  - (i) Amount required/rate of use/efficiency
  - (ii) Source/availability
  - (iii) Conservation and renewable resources
  - (iv) Scenic resources
- (2) Built Environment
  - (a) Environmental Health
    - (i) Noise
    - (ii) Risk of Explosion
    - (iii) Toxic or hazardous materials
  - (b) Land and Shoreline Use
    - (i) Land use plans/estimated population
    - (ii) Housing
    - (iii) Light and glare
    - (iv) Aesthetics
    - (v) Recreation
    - (vi) Historic and cultural preservation
    - (vii) Agricultural crops
  - (c) Transportation



- (i) Transportation systems
  - (ii) Vehicular traffic
  - (iii) Waterborne, rail, and air traffic
  - (iv) Parking
  - (v) Movement/circulation of people and goods
  - (vi) Traffic hazards
- (d) Public services and utilities
- (i) Fire
  - (ii) Police
  - (iii) Schools
  - (iv) Parks and other recreation facilities
  - (v) Maintenance
  - (vi) Communication
  - (vii) Water/storm waste
  - (viii) Sewer/solid waste
  - (ix) Other governmental services or utilities

## 4. LAND AND WATER USE PLAN

### 4.1. INTRODUCTION

#### 4.1.1. The Estuary Planning Area

The Columbia River Estuary planning area includes aquatic areas and shorelands from the 3-mile limit offshore to the eastern boundary of Wahkiakum County in Washington and the eastern boundary of Clatsop County in Oregon. All tributary streams to the head of tide and their adjacent shorelands are included within the estuary planning area. Although shorelands generally extend to the landward limit of the floodplain for planning purposes, jurisdictional boundaries of the shorelands zones define a much smaller area. This Plan's informational sections, such as descriptions of shoreland features and human uses, apply to the entire floodplain area. Regulatory sections, such as aquatic and shoreland designations and policies, apply to the narrower jurisdictional shoreland area.

The estuary is divided into 46 planning subareas. These subareas were drawn to represent distinct planning units with common features and needs. Land use patterns, physical and biological characteristics, and jurisdictional boundaries were used to determine subarea boundaries.

The subarea plans are divided into several elements, each of which addresses a different set of factors affecting land use. The elements are designed to provide local government officials, planners, and other plan users with the background information needed to evaluate development proposals. Those elements and their contents are described below.

#### 4.1.2. General Description

This section contains a description of subarea boundaries and general characteristics. The boundaries are described using, where possible, commonly known features.

#### 4.1.3. Aquatic Features

This section describes predominant aquatic area characteristics. The aquatic area is defined as all areas lying below the landward limit of aquatic vegetation or, where there is no vegetation, Mean Higher High Water. The following physical and biological characteristics are discussed:

- a. Changes to the aquatic habitats over the past century.

- b. Currents, bathymetry, salinity, tidal influences, flushing, sedimentation, and flow;
- c. Estuarine wetlands;
- d. Benthic and water-column invertebrates;
- e. Fish; and
- f. Wildlife.

#### 4.1.4. Shoreland Features

This section contains information on shoreland physical and biological features. Features discussed include:

- a. Soils;
- b. Topography;
- c. Vegetation;
- d. Nontidal wetland habitat; and
- e. Wildlife.

For informational and planning purposes, the shoreland features section describes all of the land area within the floodplain. Much of this area does not fall under the regulatory boundaries of shorelands, as defined by Washington and Oregon.

The regulatory shoreland area on the Washington side of the Columbia River Estuary includes all land within two hundred feet from the ordinary high water mark, floodways and contiguous floodplain areas landward two hundred feet from such floodways, and all marshes, bogs, swamps, and river deltas associated with the estuary (see RCW 90.030).

The regulatory estuary shorelands area on the Oregon side of the Columbia River Estuary includes all lands within fifty feet landward of the shoreline. Land with the following characteristics is also included:

- a. Lands subject to ocean flooding;
- b. Areas of geologic instability;
- c. Riparian resources;
- d. Significant shoreland and wetland biological habitats;
- e. Areas necessary for water-dependent and water-related uses;

- f. Areas of exceptional aesthetic or scenic quality;
- g. Coastal headlands; and
- h. Dikes and their associated toe drains.

#### 4.1.5. Human Use

This section describes human land and water uses in each subarea. The following factors, where applicable, are discussed:

- a. Predominant economic activities and developed land uses;
- b. Locational advantages to economic activities resulting from the presence of natural resources or from physical site characteristics;
- c. Recreational uses, both active and passive;
- d. Major point and non-point pollution sources;
- e. Navigational structures and channels;
- f. Transportation facilities; and
- g. Cumulative impacts on the subarea of particular activities (see Section 5 for region-wide cumulative impact information).

#### 4.1.6. Issues

This section focuses on the relationship between resources and uses identified in the previous three sections and existing and projected land use patterns. Areas are identified where conflicts exist between pressures for development and resource conservation. Limitations on development potential resulting from physical site characteristics are discussed with particular emphasis on changes that have taken place since adoption of the 1979 Regional Management Plan.

#### 4.1.7. Aquatic and Shoreland Designations

Based on an evaluation of the aquatic and shoreland features described in the previous sections, the Plan designates portions of the various subareas according to their development potential, resource sensitivity, and conservation needs. Aquatic and shoreland designations are used with the policies and development standards to determine the types and intensities of uses which would be permitted within the subarea. Aquatic and shoreland designations are defined in Subsection

2.1. Shoreland designations apply to the regulatory shoreland area only. This subsection defines the regulatory shoreland boundary of each subarea.

#### 4.1.8. Subarea Policies

This subsection includes policies that contain specific provisions concerning a unique physical, land use, or economic characteristic of the subarea. Policies applicable to the entire estuary are included in Subsection 3.3.

## 4.2. MOUTH OF THE COLUMBIA RIVER

### 4.2.1. General Description

This subarea includes the South Jetty, the offshore waters west to the Columbia River Entrance Buoy and the estuary between the South Jetty and a line connecting Jetty A and the North Jetty. It extends upstream to about RM 3. It does not, however, include Clatsop Spit, Jetty A, the ocean beaches or any land areas except the South Jetty. The subarea extends seaward of the three mile limit (state and county line) to the Columbia Entrance Buoy, encompassing productive areas outside the mouth of the estuary and dredged material disposal sites. The subarea includes parts of both Clatsop and Pacific Counties.

### 4.2.2. Aquatic Features

The Mouth of the Columbia River Subarea includes waters both inside the estuary and in the ocean. The river mouth has undergone large physical changes resulting from construction of the entrance jetties. Prior to jetty construction, the mouth of the river was at Cape Disappointment in Washington and Point Adams in Oregon. Large, shifting sand bars and shallow channels characterized the area. With the construction of the jetties, the mouth was moved about 3-1/2 miles seaward and constricted from 6 to 2 miles wide. The constriction of the mouth has resulted in a deeper entrance channel.

The mouth of the Columbia River is the most physically dynamic area of the estuary. Tidal currents, freshwater flow, wind-driven currents, waves, and coastal currents all affect the waters of the subarea. Currents and wave action combine to make navigation difficult.

Sediments in the subarea consist almost entirely fine sand inside the mouth and in the adjacent offshore area. Some silt is found farther offshore and south of the entrance. Outside the mouth, sediment is transported by wind-driven currents and waves. The dominant direction of sediment transport is north. From the bar inward tidal estuarine and river flow effects become much more important. Upstream bottom currents bring sand into the estuary from the ocean during low flow periods. The overall yearly balance and the effect of storms are not known.

Salinity levels in the estuary portions of the subarea vary from zero to near ocean salinities depending on tidal cycle and river discharge. During high river discharge the water column becomes stratified with bottom salinity levels greatly exceeding those on the surface. The area becomes entirely freshwater during very high river discharges and strong ebb tides. During low river discharge, the water column becomes highly stratified during reap tides and nearly unstratified during spring tides.

Plant types in the subarea include phytoplankton and marine algae. Phytoplankton productivity is high in offshore areas but is generally

low within the estuary portion of the subarea. Marine algae grow on the jetties.

Zooplankton productivity is very high in this area and seaward for several miles. Benthic invertebrate production is high in offshore marine waters but decreases toward the mouth. There is an extensive commercial crab and shrimp fishery outside the mouth, while recreational crab fishing is important inside the jetties. The main channel area is an important nursery area for juvenile Dungeness crab.

Fish in the subarea include a mix of coastal marine, estuarine and anadromous species. Common marine species include English sole, sand sole, butter sole, starry flounder, northern anchovy, surf smelt, whitebait smelt, and Pacific tomcod. Anadromous fish including longfin smelt, American shad, eulachon, and the salmonids migrate through the subarea.

Birds commonly occurring within the subarea include cormorants, gulls, surf scooters, and western grebes.

The subarea is an important feeding area for California and northern sea lions. Although the sea lion species can be found in the subarea year round, they are most common in winter and spring. Harbor seals also feed in the subarea.

#### 4.2.3. Shoreland Features

The only shorelands in the subarea are on the South Jetty, which is constructed of rock and rubble. The tip of the South Jetty is the largest California and northern sea lion haulout site in the estuary.

#### 4.2.4. Human Use

This subarea contains the downstream end of the authorized navigation channel (55 feet deep by 1/2 mile wide to RM 3). The channel is stabilized by the entrance jetties and maintained primarily by hopper dredge. The average amount dredged from this subarea is about 7 million cubic yards per year. The offshore disposal sites (Areas A, B, E, and F) are in the outer portions of this area. An in-water estuary site (Area D in the Estuary Channels Subarea) was used for disposal from the inner bar when, during rough bar conditions, disposal at sites outside the mouth (disposal sites A, B, E, and F) was too hazardous. The Corps of Engineers has adopted a change in practices to discontinue disposal of entrance material in Area D. Recreational use of the waters by small boats is high. The Buoy 10 sports fishery draws large numbers of recreational anglers to this area each summer. Commercial fishing is intensive throughout the year.

The cumulative impact of jetty construction and dredging on circulation and securing in this subarea has been substantial, particularly

with respect to deep-draft navigation. The cumulative impact of the jetties on sand transport along the ocean beaches is not well-documented, but probably significant. The cumulative impact of bar dredging on fish habitat, particularly Dungeness crabs, may be significant, but recent studies on this are inconclusive.

#### 4.2.5. Issues

The Corps of Engineers is currently studying the effects of dredging the bar on the juvenile Dungeness crab population. Study results demonstrate that the hopper dredge removes large numbers of juvenile crab from the bar. The effect of this removal on the regional crab population has not been determined.

Peacock Spit has accreted north of the North Jetty (in the Cape Disappointment Subarea) and is part of Fort Canby State Park. In recent years the spit has experienced erosion and the Washington State Parks Department desires maximum disposal of dredged material at Area E, since this may feed the beach at Peacock Spit and retard erosion. The desirability of extensive disposal at Area E needs to be evaluated, particularly as it may affect the productive crab fishery in the area.

#### 4.2.6. Aquatic and Shoreland Designations

All aquatic areas are Conservation, except:

1. Dredged material disposal sites A, B, E, and F, which are designated Development.
2. The navigation channel, plus a flowlane disposal area on each side (either 600 feet wide or to the 20-foot bathymetric contour, whichever is narrowest), is designated Development.

Shorelands on the South Jetty are designated Development.

The South Jetty is entirely within the regulatory shorelands boundary.

#### 4.2.7. Subarea Policies

1. Adverse impacts on Dungeness crab habitat and on commercial or recreational crabbing in the Mouth of the Columbia River subarea caused by dredging or by in-water dredged material disposal shall be minimized.



## 4.3. ESTUARY CHANNELS

### 4.3.1. General Description

This subarea includes the deep water portions of the estuary from Jetty A (RM 3) to the upper end of Rice Island (RM 22.5). The subarea is not restricted to the authorized navigation channel, but includes the flowlanes of both the north and south channels. The boundary of the subarea generally follows the 20-foot bathymetric contour; however, it varies from this contour in the vicinity of cities and other subareas containing deep channels. There are no intertidal wetland or shoreland areas. Portions of Clatsop, Pacific and Wahkiakum Counties, and Astoria, Hammond and Warrenton are within this subarea.

### 4.3.2. Aquatic Features

Human activities have caused some changes in the channels. Historically, the north channel carried a larger portion of the river flow than the south. Navigation structures, including primarily pile dikes and created islands, now direct a larger portion of the flow to the south channel.

Tidal and river flow are the primary factors influencing currents in the subarea. Most of the tidal exchange between the estuary and ocean occurs through the north channel. In comparison, the south channel receives less tidal flow but greater river flow. As a result, flood currents are relatively stronger in the north channel while ebb currents are relatively stronger in the south channel.

Salinity levels vary widely both over time and among different parts of the subarea. The eastern extent of the subarea represents the normal upstream limit of salinity intrusion. Salinity levels increase in the downstream direction. In most of the subarea salinity levels vary from freshwater condition to 33 ppt. Generally, salinity levels in bottom waters are greater than those on the surface. Saline water intrudes farther upstream in the north channel than in the south.

Sediments in the subarea range primarily from coarse to medium sand. Patches of very fine sand, silt, and clay appear periodically in the portion of the channel between approximately RM 8 and 18. In addition, the south channel contains fine sand during low river discharge months in the area between RM 8 and 12. The area of finer sediments results from settling of sediments associated with the turbidity maximum zone. This zone is the area where upstream suspended sediment transport converges with downstream sediment transport.

Sediment bedload transport is upstream on the channel bottoms from about Hammond to Astoria during the low river discharge and winter months and in the vicinity of Hammond only during high river discharge. Upriver from these regions, bedload transport is downstream. The area

of bedload sediment transport convergence generally corresponds with the turbidity maximum zone.

The only plant type in the subarea is phytoplankton. Phytoplankton productivity is relatively high at the upstream end of the subarea and decreases to relatively low levels toward the downstream end.

All of the estuary's major invertebrate groups, zooplankton, benthic infauna, and epibenthic organisms, have been studied in the subarea. The accumulation of particulate organic matter in the turbidity maximum zone allows for very high zooplankton and epibenthic organism population densities in the area between RM 8 and 18. The most abundant planktonic organism in this region, Eurytemora affinis, has been most considered by researchers to be the most important food species for fish in the estuary. As a result of dynamic sediment conditions benthic infauna populations are relatively sparse in the channels. Dungeness crab use the western part of the subarea as a nursery area.

Fish populations in the estuary tend to concentrate in the area between RM 6 and 19, due to the abundant supply of invertebrate food species. The subarea is an important nursery area for marine bottom species such as English sole, starry flounder, and Pacific staghorn sculpin. Pacific tomcod, snake prickleback, and northern anchovy are seasonally abundant in the channels. White and green sturgeon populations concentrate in the deeper portions of the subarea, primarily in the north channel near the Astoria-Megler Bridge and in the south channel off Tongue Point. Pacific herring, shiner perch, and longfin smelt possibly spawn in the subarea.

In addition to longfin smelt, other anadromous species including American shad, eulachon, and the salmonids utilize the subarea as a migration route and nursery area. Adult American shad migrate upriver primarily in June and July while juveniles migrate downriver mainly in November and December. Juvenile shad use the channels year round as a nursery area. Eulachon migrate upriver from December through April with a peak run in February. All of the salmonid species abundant in the estuary use the channels as a migration route. Subyearling chinook migrate downriver primarily from March through August. Yearling chinook and coho salmon and juvenile steelhead and cutthroat trout migrate through the subarea primarily in spring.

Several bird species, particularly the fish-eaters, utilize the subarea. Bird concentrations tend to be greater in the north channel than the south channel. Cormorants use primarily the western portion of the subarea while common mergansers and western grebes use the eastern portion. Surf scoters are also abundant in the subarea. Bald eagles associated with nesting sites near Tongue Point and along the northern shore of the estuary feed in the subarea.

The channels are important feeding areas for harbor seals and California sea lions. Harbor seals use the subarea year round while California sea lions use the channels primarily in winter.

#### 4.3.3. Human Use

Navigation, maintenance dredging, and dredged material disposal are the predominant human activities in the ship channel. Waste disposal, principally from fish processing, is a lesser use. There are also gillnet drifts in and around the north and south channels. Recreational fishing for salmon and sturgeon is important. Recreational and commercial crabbing occur off Hammond and the Sand Islands. The cumulative impacts of navigation channel maintenance on the southern arm of this subarea have been significant with respect to both navigation and circulation. The northern arm of the subarea has been affected by decreased river flow and some shoaling as a result of river training structures.

#### 4.3.4. Issues

In-water disposal of dredged material is an issue of concern. Approximately 1.2 million cubic yards of dredged material are removed from this reach each year. Approximately 630,000 cubic yards of material are placed in the Harrington Point Sump by hopper dredge each year, and eventually moved by pipeline dredge to Rice Island (See the Estuary Sands Subarea Plan). Approximately 650,000 cubic yards are deposited in Area D annually.

Area D is located in the north channel of the Columbia River Estuary approximately 4,200 feet south of the Chinook pile dike. Disposal of dredged material at Area D is a major concern. The Corps of Engineers places dredged material at Area D for several channel maintenance projects in the lower estuary. A study by CREST (Benoit and Fox, 1986: Dredged Material Disposal at Area D) made several recommendations, including a maximum limit of 3,250,000 yards of dredged material over a 5-year time period.

#### 4.3.5. Aquatic Designations

All aquatic areas are Conservation except:

1. The main navigational channel, plus a flowlane disposal area on each side of the channel (either 600 feet wide or to the 20 feet below MLLW contour, whichever is narrower) is designated Development.
2. Designated dredged material disposal sites are designated Development.

#### 4.3.6. Subarea Policies

1. The use of the Area D in-water dredged material disposal site shall be kept to an absolute minimum. In all cases, ocean disposal shall be substituted for the use of this site whenever feasible. The use of Area D shall be regulated by implementing cubic yardage limitations for dredged material disposal. The Corps of Engineers should continue to examine alternative disposal sites and methods that would result in fewer adverse shoaling impacts. The use of Area D should be discontinued when feasible alternatives are found.
2. The U.S. Army Corps of Engineers shall continue to review navigation improvements and the impacts of disposal of dredged material at Area D with the objective of minimizing undesirable sedimentation.

#### 4.4. ESTUARY SANDS

##### 4.4.1. General Description

This subarea includes the extensive mid-estuary sand flats between approximately RM 6 and RM 24 and the adjacent slopes to as deep as 20 feet below MLLW. These include Desdemona and Taylor Sands, the Tongue Point bar and other unnamed sands, the largest of which extends west and north from Rice Island into Grays Bay. Rice Island, a dredged material island, is also included. Rice Island and adjacent water areas are part of the Lewis and Clark National Wildlife Refuge. This subarea includes portions of Clatsop, Pacific and Wahkiakum Counties.

##### 4.4.2. Aquatic Features

The western part of this subarea has accreted significantly since the construction of the jetties at the mouth. The increase in tidal currents resulting from constriction of the mouth by the jetties has caused sediments forming the natural tidal delta to be transported both into the estuary and out to sea. A portion of the sediment transported into the estuary has accumulated in the estuary sands subarea.

Strong river and tidal currents and wind waves create the high energy environments of the Estuary Sands Subarea. The broad, shallow channels between Desdemona and Taylor Sands form the main corridor of water transport between the north and south channels. Water flows southeasterly from the north to the south channel during flood tides and northwesterly from the south to the north channels during ebb tides.

Salinity levels are similar to surface salinities found in the adjacent north and south channels (see Estuary Channels Subarea Plan).

The subarea has a wide range of sediment types. The tidal flat sediments range from medium to fine sand while the surrounding slopes contain coarse to medium sand. Scattered deposits of silt and clay appear intermittently throughout the subarea.

Plant types in the subarea include phytoplankton and benthic algae. Phytoplankton productivity is similar to that found in the adjacent north and south channel (see Estuary Channels Subarea Plan). Benthic algae productivity on the sands is low due to the instability of the sediments.

Invertebrate, fish and bird species present in the subarea are similar to those found in the surrounding north and south channels (see Estuary Channels Subarea Plan). The subarea is an important fish and bird feeding area.

Taylor Sands and the surrounding waters are important feeding areas for the Mill Creek bald eagle pair (see Tongue Point Subarea Plan). Feeding in this area is particularly intense during the nesting season.

A pile dolphin on Taylor Sands provides an important hunting perch for the eagles.

The subarea contains the largest harbor seal haulout sites in the estuary. Dsdemona and Taylor Sands each contain two haulout sites. The largest site, on Dsdemona Sands, is used by about 50% of the estuary's harbor seal population in winter and early spring, nearly 100% of the population in late spring and summer, and 80 to 90% of the population in fall.

#### 4.4.3. Shoreland Features

The only shorelands in the subarea occur on Rice Island. Rice Island is a large dredged material disposal island created to receive material from the main navigation channel, and to direct river flow. The island has some planted vegetation, primarily grasses, to stabilize the sand. Canada geese nest on the island.

#### 4.4.4. Human Use

Major uses and activities in this subarea include gillnet drifts along the margins of the sands and in the minor channels between the sand bars, recreational boating, and small boat and tug navigation across the river. Dredging and dredged material disposal have occurred on and around various sands. The sands were used for horse seining and fish traps when such activities were practiced. The only area currently being used for dredged material disposal is Rice Island, an entirely man-made island created for the dual purposes of flow control and dredged material disposal. The cumulative impact of channel maintenance (dredging and river training) on circulation and sediment transport has been significant in this subarea. Shoaling has increased substantially in this subarea as a result of jetty construction and other channel maintenance activities.

#### 4.4.5. Issues

Potential uses of the sand flats include dredged material disposal, recreation, aquaculture, and restoration. The Corps of Engineers has proposed creation of additional islands for dredged material disposal. State and federal resource agencies have raised concerns regarding the proposal and it may not be actively pursued. Island creation for dredged material disposal would require amendment of local shoreline master programs and comprehensive plans.

The Corps of Engineers and the U.S. Fish and Wildlife Service cooperate with regard to management of dredged material disposal is-

lands. The cooperative agreement provides for continued dredged material disposal on Rice Island, and establishes timing of disposal as well as revegetation and habitat maintenance techniques.

#### 4.4.6. Aquatic and Shoreland Designations

Subtidal aquatic areas and the narrow tidal flat along the south shore of Rice Island are Conservation. All other tidal flats are Natural.

All shoreland areas are Conservation.

Rice Island is entirely within the regulatory shorelands area.

#### 4.4.7. Subarea Policies

1. Proposals to enlarge existing dredged material disposal islands or to create new ones will require an exception to Oregon Statewide Planning Goal 16.
2. The use of heavy equipment on rice Island in association with dredged material disposal activities is appropriate.

## 4.5. RIVER CHANNELS

### 4.5.1. General Description

This subarea includes the deep water portions (deeper than 20 feet below MLLW) of the authorized navigation channel and adjacent slopes between Harrington Point (RM 22.5) and the western end of Puget Island. The authorized navigation channel is in this subarea, but side channels are not included. There are no intertidal wetlands or shorelands. Some water areas are part of the Lewis and Clark National Wildlife Refuge. Parts of Wahkiakum and Clatsop Counties are included.

### 4.5.2. Aquatic Features

While tides and tidal currents are important in this reach, fresh water flow increasingly dominates circulation patterns toward the upriver end. Salinity intrusion varies, depending on freshwater flow and the tides, but will normally not extend past Pillar Rock. Flood tide currents may not be observable under high flow conditions, and the 100-year flood level rises sharply toward the upstream limit of the subarea.

Sediments in the channel and slopes are largely medium to coarse sand, with some gravel. Compacted finer sediments are found in some scour holes. The transport of sand and gravel as bedload is almost entirely downstream. Some sand will also move in suspension under freshet conditions.

Phytoplankton comprise the only plant type found in the subarea. The phytoplankton consist primarily of freshwater species carried into the estuary from upriver. They exhibit relatively high productivity levels in the subarea. As these freshwater species encounter saline water downriver from the subarea many are killed. This accounts for the lower phytoplankton productivity in downriver subareas (see Estuary Channels Subarea Plan).

Zooplankton, benthic infauna, and epibenthic organism species occurring in the subarea consist primarily of freshwater species. Population densities are relatively low.

Fish species present in the subarea include freshwater fishes, marine fishes tolerant of low salinities, and anadromous fishes. The most abundant freshwater species include threespine stickleback, peamouth, and prickly sculpin. Principal marine species in the subarea include starry flounder, Pacific staghorn sculpin, Pacific tomcod, and snake prickleback. White sturgeon concentrate in deep channel areas. The primary anadromous species include American shad, eulachon, and the salmonids (see Estuary Channels Subarea Plan).

Several species of water birds utilize the subarea. Double-crested cormorants associated with nesting sites on range markers off of Miller



Sands are abundant. Waterfowl species, including mallard, surf scoter, and common merganser, feed in the subarea.

Two marine mammal species, harbor seals and California sea lions use the subarea. They are most common in winter when the seals and sea lions feed on the eulachon run as it moves upriver.

#### 4.5.3. Human Use

The main navigation channel passes through this area. Dredging is required at five separate bars, with an average 900,000 cubic yards removed annually by pipeline and 625,000 cubic yards by hopper dredge. In-water disposal occurs at the Harrington Point Sump (for re-handling) and at several flowlane disposal sites along the main navigation channel. Numerous pile dikes exist. Gillnet drifts exist along the edge of and in the main navigation channel. Commercial sturgeon gillnetting, sports fishing and pleasure boating also occur. The cumulative impact of channel maintenance activities on water quality and circulation may be substantial.

#### 4.5.4. Issues

Major issues in this subarea are related to dredging, disposal and navigational structures and their impact on fish habitat and commercial fisheries. Replacement of pile dikes in this area is being studied by the Corps of Engineers. Depending on the results of monitoring the prototype rock groin at Cottonwood Island, the Corps may consider replacing aging pile dikes in this subarea with rock groins.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be consulted concerning timing and location of in-water activity.

#### 4.5.5. Aquatic Designations

The main navigation channel on each side of the channel (extending either 600 feet or to the 20-foot bathymetric contour, whichever is narrowest), are designated Development. All other areas are Conservation.

#### 4.5.6. Subarea Policies

1. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.
2. In-water activities that may leave snags in gillnet drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.

## 4.6. SNAG ISLANDS

### 4.6.1. General Description

This subarea includes dredged material disposal islands (Miller Sands and Jim Crow Sands), tidal marsh (around the Snag Island Jetty and Miller Sands), the Woody Island Channel, exposed sand bars south and west of Woody Island Channel, and various subsidiary channels. The entire subarea is within the Lewis and Clark National Wildlife Refuge, and within Clatsop County.

### 4.6.2. Aquatic Features

The aquatic portion of this subarea consists of several small marsh islands and sandflats separated by a network of shallow channels. Historically the subarea has tended to shoal due to navigation structures and created islands which have channeled most of the river flow through the main navigation channel. There are more tidal marshes and flats in the subarea than occurred a century ago. Woody Island channel which runs along the southern boundary of the subarea was once an important navigation channel. Parts of the channel are now too shallow for safe navigation by all but the smallest boats.

Little is known about currents in the subarea. Woody Island channel is the main corridor for water transport through the subarea. The subarea is primarily freshwater. During very low river discharge conditions, saline water extends into Woody Island channel.

Sediments in most of the subarea are sandy. Coarse sand occurs in the deeper areas while fine sand occurs on the flats. Sediments in the tidal marshes probably consist mainly of silt and clay.

Plant types in the subarea include phytoplankton, benthic algae, and tidal marsh vegetation. Phytoplankton productivity is relatively high. Benthic algal productivity on the predominantly sandy tidal flats is very low. The marshes of the subarea include colonizing low marshes dominated by bulrush (Scirpus validus) and higher elevation low marshes dominated by Lyngby's sedge (Carex lynbyei), reed canary grass (Phalaris arundinacea), and cattail (Typha angustifolia). The colonizing marshes develop on the downstream side of the islands while the higher marshes develop on the upstream sides.

Of the estuary's invertebrate types, only benthic infauna and epibenthic organisms have been studied in the subarea. Benthic infauna densities are high. Important fish prey species such as the amphipod Corphium salmonis and the clam Corbicula manilensis are abundant. Epibenthic organism densities are also high in the subarea.

Fish species present in the subarea are the same as those found in the River Channels Subarea and the upstream end of the Estuary Channels

Subarea. The shallow tidal flats and marsh channel are important feeding and nursery areas for juvenile salmonids.

Several species of water birds utilize the subarea. Double-crested cormorants nest on channel range markers west of Miller Sands. Western and glaucous-winged gulls occupy a small nesting colony on the western tip of the Miller Sands sandspit. Abundant waterfowl in the subarea include western grebe, mallard, and common merganser.

Marine mammal use of the subarea concentrates around a haulout site south of Miller Sands. Harbor seals occupy this haulout year-round with peak use in spring and winter. The aquatic mammal species muskrat and nutria utilize the marshes of the subarea.

#### 4.6.3. Shoreland Features

Shoreland in the subarea include Miller Sands and Jim Crow Sands, both dredged material disposal islands. Soils on the islands consist of Columbia River sand. Both islands are relatively low and flat.

Vegetation has been planted on the islands to help stabilize the sand. Miller Sands has some well-developed grasslands and shrub and willow/cottonwood habitat on the main island. Only scattered grasslands have become established on Jim Crow Sands.

Wildlife on the islands includes small mammals such as muskrat and nutria and several bird species. Bald eagles hunt from the islands. Canada geese nest on Miller and Jim Crow Sands. There is a small nesting colony of Caspian terns on Miller Sands.

#### 4.6.4. Human Use

Activities in this area include navigational improvements, dredged material disposal, commercial and sports fishing, wildlife observation, waterfowl hunting, and trapping. Active dredging material disposal sites are located on Jim Crow Sands and Miller Sands. Gillnet drifts are found in Woody Island Channel and along the margins of the navigational channel.

#### 4.6.5. Issues

The establishment of duck shacks in the sloughs and along the shores of the islands is a long-standing issue. These structures are approved for temporary periods (i.e., the hunting season) and not for use as permanent residences. However, in some cases, they have been improved beyond their intended function.

A proposal involving a possible exchange of the State of Oregon's ownership interests in some estuary islands, including Miller Sands and Jim Crow Sands Islands, for federal property on the South Tongue Point peninsula was investigated in 1987. As part of the proposal, the federal government would consolidate ownership of islands in the Lewis and Clark National Wildlife Refuge (except Mott Island). The State of Oregon would expand its ownership on the old naval station site on the North Tongue Point peninsula and acquire the South Tongue Point peninsula, facilitating its plans for development of the Tongue Point area. Clatsop County may also quitclaim its relatively minor ownership interests in the estuary islands to the federal government in exchange for in-lieu-of-tax payments.

This area is relatively distant from all boat ramps. The hunting and sport fishing use of this area is probably less than in some other subareas. All areas except Miller Sands are open to hunting and trapping. Future use of Miller Sands and Jim Crow Sands is an issue of concern. Public access to the wildlife refuge is discussed in the Upper Marsh Islands Subarea Plan.

#### 4.6.6. Aquatic Designations

All aquatic areas are designated Conservation except:

The wetlands above the 3 feet bathymetric contour surrounding the Snag Island Jetty; the wetlands north of Green Island; and the unnamed sands southeast of the Woody Island Channel area are all designated Natural.

Shorelands, including Miller Sands and Jim Crow Sands, are designated Conservation.

Jim Crow Sands and Miller Sands Islands are within the regulatory shoreland boundary.

#### 4.6.7. Subarea Policies

1. Measures that increase or enhance public access opportunities to the Wildlife Refuge are encouraged.
2. The use of heavy equipment in association with dredged material disposal on Miller Sands and Jim Crow Sands is appropriate.

#### 4.7. CATHLAMET BAY

##### 4.7.1. General Description

This subarea includes Lois, Mott, Green, Russian, Seal, McGregor and unnamed marsh islands; sand and mud flats; and parts of South, Prairie and other subsidiary channels. It extends from near Tongue Point (RM 19) to RM 25. The entire subarea is in the Lewis and Clark Wildlife Refuge, and within Clatsop County.

##### 4.7.2. Aquatic Features

The aquatic features in this subarea include several tidal marsh islands separated by relatively deep, narrow channels. Historically, this subarea has tended to shoal and develop more marsh habitat. The marshes of Green Island have developed in the past century. Also, the unnamed marsh islands in the western part of the subarea increased in size since the creation of Lois Island.

There is little information on currents in the subarea. The subarea is primarily freshwater with some salinity intrusion in the deeper water areas north of Lois and Mott Islands. Sediments in the subarea are similar to sediments in the Snag Islands Subarea.

The plant types present in the subarea include phytoplankton, benthic algae, and tidal marsh and swamp vegetation. Phytoplankton and benthic algal productivity are similar to that in the Snag Islands Subarea. The low marshes of Green Island and the unnamed island east of Lois Island have developed a pattern of growth common in the Cathlamet Bay islands. The lowest elevation marshes develop on the downstream sides of the islands and the highest on the upstream sides. The downstream sites consist of bulrush (Scirpus validus) dominated colonizing low marshes which grade into tidal flats, while the upstream sides consist of higher elevation marshes dominated by Lyngby's sedge (Carex lyngbyei). The marshes of Russian Island are slightly higher than those on the other islands. They are dominated by Lyngby's sedge, horsetail (Equisetum fluviatile), rush (Juncus oxymersis), wappato (Sagittaria latifolia), water parsnip (Sium suave), and creeping spikerush (Eleocharis palustris). The marsh islands have an extensive network of tidal channels. These channels are important as feeding and shelter areas for juvenile salmonids. Although they have not been studied extensively in the Columbia, marshes and associated tidal channels have been demonstrated to be the most important salmon rearing habitats in other estuaries. Lois and Mott Islands are surrounded by tidal marshes and swamps. The marshes are similar to others found in the subarea. The swamps contain primarily shrub species.

Invertebrate and fish species in the subarea are similar to those found in the Snag Island Subarea.

Bird species common in the subarea are similar to those in the Snag Island Subarea. In addition, great blue heron and shorebirds utilize the subarea. Bald eagles use the subarea intensively as a feeding area. South channel and the unnamed island and associated flats east of Lois Island are used most frequently. Eagles also feed on Green and Russian Islands and the marshes and flats around Lois Island. Piling on the northern side of south channel are important bald eagle perching sites. A breeding pair of eagles known as the Twilight Creek pair as well as many non-breeding eagles that occupy the area primarily in winter and spring use the subarea.

Marine mammal use of the subarea primarily occurs on and adjacent to a harbor seal haulout site on Green Island. Although a relatively small number of harbor seals utilize the site, it is one of the few haulouts in the estuary where harbor seals give birth to young. They generally give birth in late spring and raise the pups through summer. The group of harbor seals remaining in the Columbia River during this period generally produce fewer than 10 pups per year.

Aquatic and terrestrial mammals utilize the marshes and swamps of the subarea. Muskrat and nutria occupy the marsh islands. These species, along with beaver and raccoon are found in the swamps surrounding Lois and Mott Islands.

#### 4.7.3. Shoreland Features

Shorelands in the subarea are on Lois and Mott Islands. Both islands were created from material dredged from the MARAD Basin and Tongue Point pier area. Both Islands are wooded with willow and alder along the fringes and grass-covered on the interiors. Wildlife values are considered high. There is a bald eagle perch site on the easternmost point of Lois Island.

#### 4.7.4. Human Use

Human use of this area includes sports and commercial fishing, log storage and transport, hunting, trapping, and wildlife observation. None of these could be classified as intensive.

#### 4.7.5. Issues

The tidal flats and marshes of Cathlamet Bay are a highly productive, integral part of the estuarine ecosystem. Their inclusion in the Lewis and Clark National Wildlife Refuge provides needed protection for fish and wildlife resources in the area.

The establishment of duck shacks in the sloughs and along the shores of the islands is a long-standing issue. These structures are approved for temporary periods (i.e., the hunting season) and not for use as permanent residences. However, in some cases, they have been improved beyond their intended function.

Both Mott and Lois Islands are within the wildlife refuge and the habitat value of the upland areas for birds and wildlife is high. The U.S. Fish and Wildlife Service (USFWS) has indicated that they generally oppose use of the area for dredged material disposal. Recreational fishing and boating may conflict with port development in the Tongue Point area. Public access to the islands in the Wildlife Refuge is limited. USFWS does not provide any access facilities, and does not manage the refuge for public access.

#### 4.7.6. Aquatic and Shoreland Designations

Aquatic areas are Conservation, except for tidal marsh and other wetland areas on and adjacent to the islands which are designated Natural.

Shoreland areas in this subarea are designated Natural.

The entire upland portions of Lois and Mott Islands are included in the regulatory shoreland boundary.

#### 4.7.7. Subarea Policies

1. Measures that increase or enhance public access opportunities to the Wildlife Refuge are encouraged.



#### 4.8. UPPER MARSH ISLANDS

##### 4.8.1. General Description

This diverse group of marsh islands and interconnecting channels extends between Minaker Island (RM 26) and Welch Island (RM 35). The subarea includes Minaker, Karlson, Marsh, Brush, Horseshoe, Woody, Tronson, Quinns, Goose, Grassy, Fitzpatrick and Welch Islands. Large sections of these islands consist of forested and shrub swamps, with tidal marsh in the lower areas. Sand and mudflats also occur. The shorelands are current or former dredged material disposal sites on Woody, Welch, and Fitzpatrick Islands. The entire area is in the Lewis and Clark National Wildlife Refuge, and within Clatsop County.

##### 4.8.2. Aquatic Features

The aquatic portions of this subarea include several large intertidal marsh and swamp islands separated by relatively deep, narrow channels. Historically the area has changed little compared with other areas of the estuary. Horseshoe and Grassy Island marshes have enlarged slightly in the last century.

There is little information on currents in the subarea. Saline water does not intrude into the subarea. Sediments consist primarily of very fine sand, silt, and clay. Prairie Channel contains some coarser sandy sediments.

The plant types in the subarea include phytoplankton, benthic algae, and tidal marsh and swamp vegetation. Phytoplankton and benthic algal productivity levels are similar to those in the Snag Islands Subarea. The islands of the subarea contain the largest tracts of intertidal tidal marsh and swamp in the estuary.

Most of Minaker Island is low marsh, with high marsh and mixed shrub vegetation in a few areas. Karlson Island is more complex. About one-fourth of the island was diked, but the dikes have breached and the area has returned to tidal marsh. The western end of the island is undisturbed tidal marsh. The rest of the island is tidal swamp consisting of willow and a species mixture of alder, Sitka spruce, western red cedar and cottonwood. Brush and Horseshoe Islands are a mixture of low marsh, high marsh, and swamp. Marsh and Woody Islands consist mostly of tidal swamp with some marsh. There is some willow swamp on Quinns and Tronson Islands and some marsh on Goose, Grassy and Quinns Islands. Fitzpatrick Island is dominated by low marsh. Welch Island is covered with high sedge marsh, and cottonwood and willow swamp. The marsh and swamp islands have an extensive network of tidal channels. These channels are important as feeding and shelter areas for juvenile salmonids. Although they have not been studied extensively in the Columbia, marshes and associated tidal channels have been demonstrated to be the most important juvenile salmon rearing habitats in other estuaries.

Invertebrate and fish species in the subarea are similar to those in the Snag Island Subarea.

Several species of resident and migratory birds feed and nest in the subarea. Because of presence of several types of habitats, the subarea has the greatest bird numbers and species diversity in the estuary. Double-crested cormorant feed in the water areas in summer, fall, and winter. Western grebe and several other species of migratory waterfowl winter in the subarea. Common merganser and mallard, both resident waterfowl, nest in the marshes of the subarea. Other resident waterfowl species that nest in the subarea's marshes include green-winged teal, wood duck, and blue-winged/cinnamon teal. Green-winged teal and wood duck are most concentrated on Karlson Island. Shorebirds feed in the tidal flats, low marsh, and high marsh habitats. Great blue heron feed in the subarea year round and occupy a larger nesting colony in a tidal spruce swamp on Karlson Island. The marshes and swamps of the subarea also contain a diverse array of land birds. The subarea provides important bald eagle habitat. Karlson, Marsh, and Quinns Islands have bald eagle nesting sites within the wooded tidal swamp habitats. In addition to supporting two nesting pairs of eagles, the subarea also provides feeding habitat for wintering and transitory eagles.

The marshes and swamps of the subarea receive the greatest aquatic and terrestrial mammal use in the estuary. Muskrat and nutria feed and den primarily in the tidal marshes. Muskrat are particularly abundant in the sedge-dominated low marshes. Beaver feed and den in the Sitka spruce and willow swamps while raccoon utilize the shrub swamps of the subarea. River otter feed in the tidal sloughs of the subarea's swamps. Two species of deer, the black-tailed deer and the Columbian white-tailed deer, utilize the subarea. Black-tailed deer feed in the swamps of the larger islands as well as on the mainland. Columbian white-tailed deer, an endangered species, occur on Karlson and Welch Islands.

#### 4.8.3. Shoreland Features

The shorelands in the subarea consist of dredged material disposal sites on Welch, and Fitzpatrick Islands and an inactive dredged material disposal site on Woody Island. These areas are primarily sandy with little wildlife value. The Soil Conservation Service is revegetating the eastern part of the Fitzpatrick Island disposal site. Welch Island is being revegetated by the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service in accordance with an agreement on its use for dredged material disposal. Woody Island has been revegetating naturally.

#### 4.8.4. Human Use

Human uses in the area include dredged material disposal, log storage and transport, small boat navigation, sports and commercial fishing, hunting, trapping, and wildlife observation.

#### 4.8.5. Issues

The main access point is at Aldrich Point, and the nearby islands probably receive more use than islands more distant from the boat ramp. Karlson Island is closed to all public use. Welch Island is subject to seasonal access regulations. Otherwise, the islands are open to the public, but access is difficult.

The use of duck shacks in the subarea's sloughs is an issue. They are sometimes used as permanent dwellings. The U.S. Fish and Wildlife Service believes that this level of use is incompatible with the refuge's goal of wildlife protection and management. The U.S. Fish and Wildlife Service does not provide any public access facilities for the refuges, and does not manage the refuges for public access. Increased public access, consistent with wildlife management needs, is desired locally.

#### 4.8.6. Aquatic and Shoreland Designations

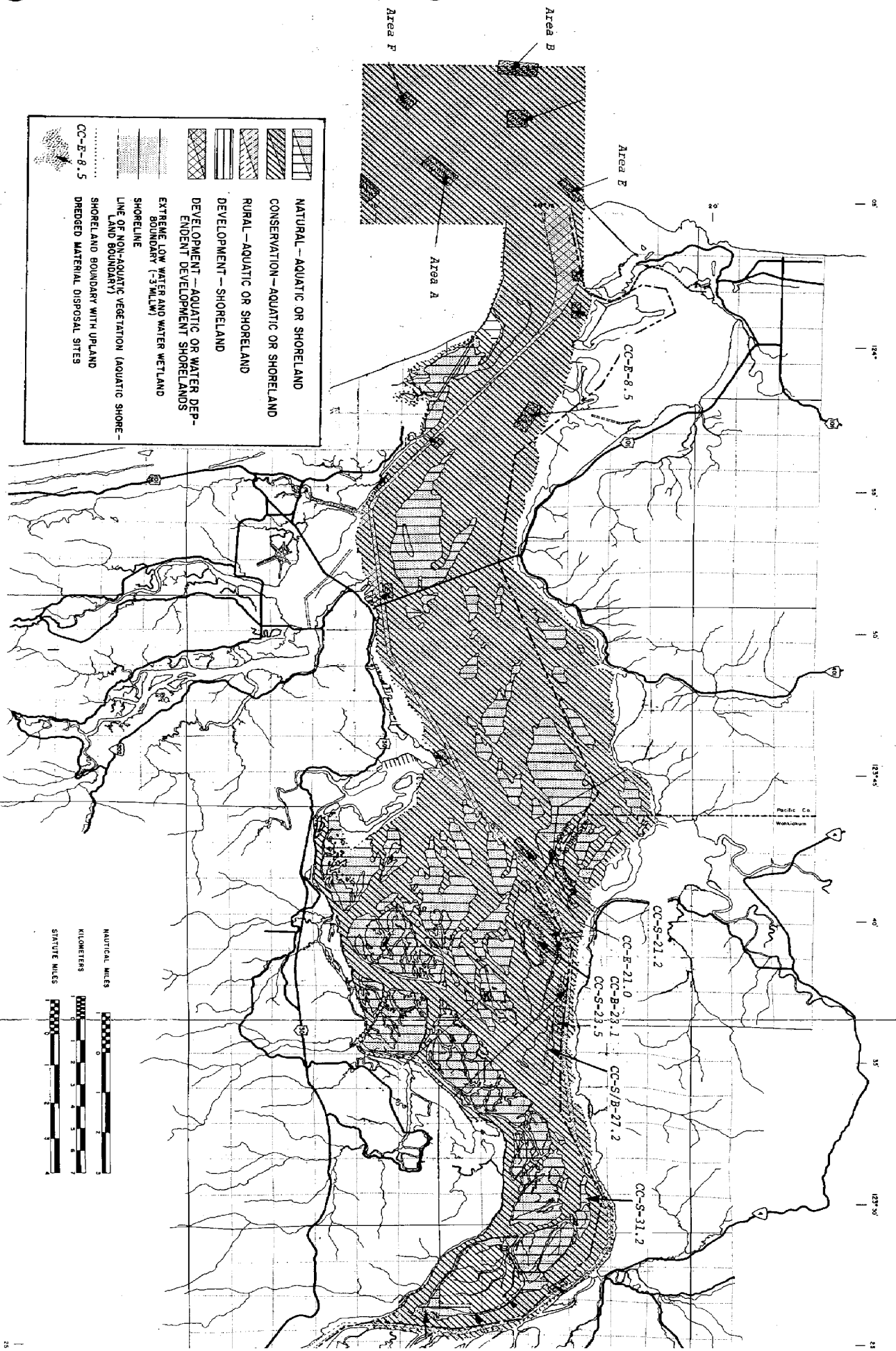
The marsh and tideflat areas and the formerly diked area on Karlson Island are Natural. All other water areas are Conservation.

The shoreland areas on Woody, Welch, and Fitzpatrick Islands are designated Conservation.

The dredged upland sites on Woody, Welch, and Fitzpatrick Islands are entirely within the regulatory shorelands boundary.

#### 4.8.7. Subarea Policies

1. Measures that increase or enhance public access opportunities to the Wildlife Refuge are encouraged.
2. The use of heavy equipment in association with dredged material disposal on Welch and Fitzpatrick Islands is appropriate.



[Hatched pattern]	NATURAL - AQUATIC OR SHORELAND
[Hatched pattern]	CONSERVATION - AQUATIC OR SHORELAND
[Hatched pattern]	RURAL - AQUATIC OR SHORELAND
[Hatched pattern]	DEVELOPMENT - SHORELAND
[Hatched pattern]	DEVELOPMENT - AQUATIC OR WATER DEPENDENT DEVELOPMENT SHORELANDS
[Hatched pattern]	EXTREME LOW WATER AND WATER WETLAND BOUNDARY (-3 M.L.W.)
[Hatched pattern]	SHORELINE
[Hatched pattern]	LINE OF NON-AQUATIC VEGETATION (AQUATIC SHORELAND BOUNDARY)
[Hatched pattern]	SHORELAND BOUNDARY WITH UPLAND
[Hatched pattern]	DREDGED MATERIAL DISPOSAL SITES

4-2 Mouth of the Columbia River; 4-3 Estuary Channels; 4-4 Estuary Sands; 4-5 River Channels;  
 4-6 Snag Islands; 4-7 Cathlamet Bay; 4-8 Upper Marsh Island

#### 4.9. TENASILLAHE ISLAND

##### 4.9.1. General Description

This subarea extends from Multnomah Slough (RM 35), which separates Welch and Tenasillahe Islands, to the pile dike (RM 38) at the upstream end of Tenasillahe Island, to the south side of the Main Channel and to the center of the Clifton Channel. Most of the perimeter of Tenasillahe Island is forested wetland. The remainder inside the dike is pasture land and wetland. The island is part of the Columbia White-tailed Deer National Wildlife Refuge. The entire subarea is in Clatsop County.

##### 4.9.2. Aquatic Features

The aquatic portions of this subarea include waters adjacent to the main navigation channel and in Clifton Channel and tidal marshes and swamps which fringe Tenasillahe Island. Historically the subarea has undergone large changes. Tenasillahe Island once consisted of a large tidal marsh and swamp. It is now primarily diked pasture land and nontidal wetland. A small island south of Tenasillahe Island has been created from dredged material.

Physical characteristics in the waters surrounding the island areas similar to those in the River Channels Subarea.

Phytoplankton, invertebrate, and fish productivity and species are similar to those in the River Channels Subarea.

Tidal marsh and swamp fringe the island. The tidal swamp on the south and east side of the island has been proposed for designation as a Federal Research Natural Area because it represents some of the last remaining habitat of tidally-influenced deciduous forest in the lower Columbia River that has not been altered by diking and ditching activities.

Many of the water bird species found in the Snag Islands and Cathlamet Bay Subareas utilize the waters and wetlands surrounding Tenasillahe Island. A pair of bald eagles nest in the tidal swamp on the southeast side of the island.

Aquatic and terrestrial mammal use of the marshes and swamps surrounding the island is similar to mammal use in the Upper Marsh Islands Subarea.

##### 4.9.3. Shoreland Features

Shorelands include Tenasillahe Island and a small island to the south. Tenasillahe Island is a diked, former tidal wetland. The small

island to the south consist of sandy sediments dredged from the main navigation channel.

Vegetation on Tenasillahe Island includes pastures with a mix of grasses and rush, and wooded areas consisting largely of alder, willow, and cottonwood. There are several sloughs on the island which are surrounded by large nontidal wetlands. Several of the wetlands are classified as significant under Oregon Statewide Planning Goal 17.

Wildlife values on the island are high. The island serves as a wintering area for mallards, Canada geese, whistling swans, and other waterfowl species. Muskrat, nutria, and beaver are common. Tenasillahe Island is managed for Columbia white-tailed deer, an endangered species, by the U.S. Fish and Wildlife Service. The island's population of this species is between 50 and 60 animals.

#### 4.9.4. Human Use

Human use of the area includes log storage and transport, small boat navigation, sports and commercial fishing, wildlife management and observation and grazing on the island. There is a log storage area along Clifton Channel and commercial fishing areas along both the Clifton and Main Channel sides of Tenasillahe Island. There is restricted public access to the island; however, a private duck hunting club has access during certain periods of the year to an area near Multnomah Slough.

The cumulative impact of diking has been significant in this area. Diking at the turn of the century resulted in the conversion of Tenasillahe Island from tidal marsh and swamp to pasture.

#### 4.9.5. Issues

Log storage and public access are issues, as they are in the Upper Marsh Islands Subarea. The establishment and expansion of beach nourishment sites are also of concern.

#### 4.9.6. Aquatic and Shoreland Designations

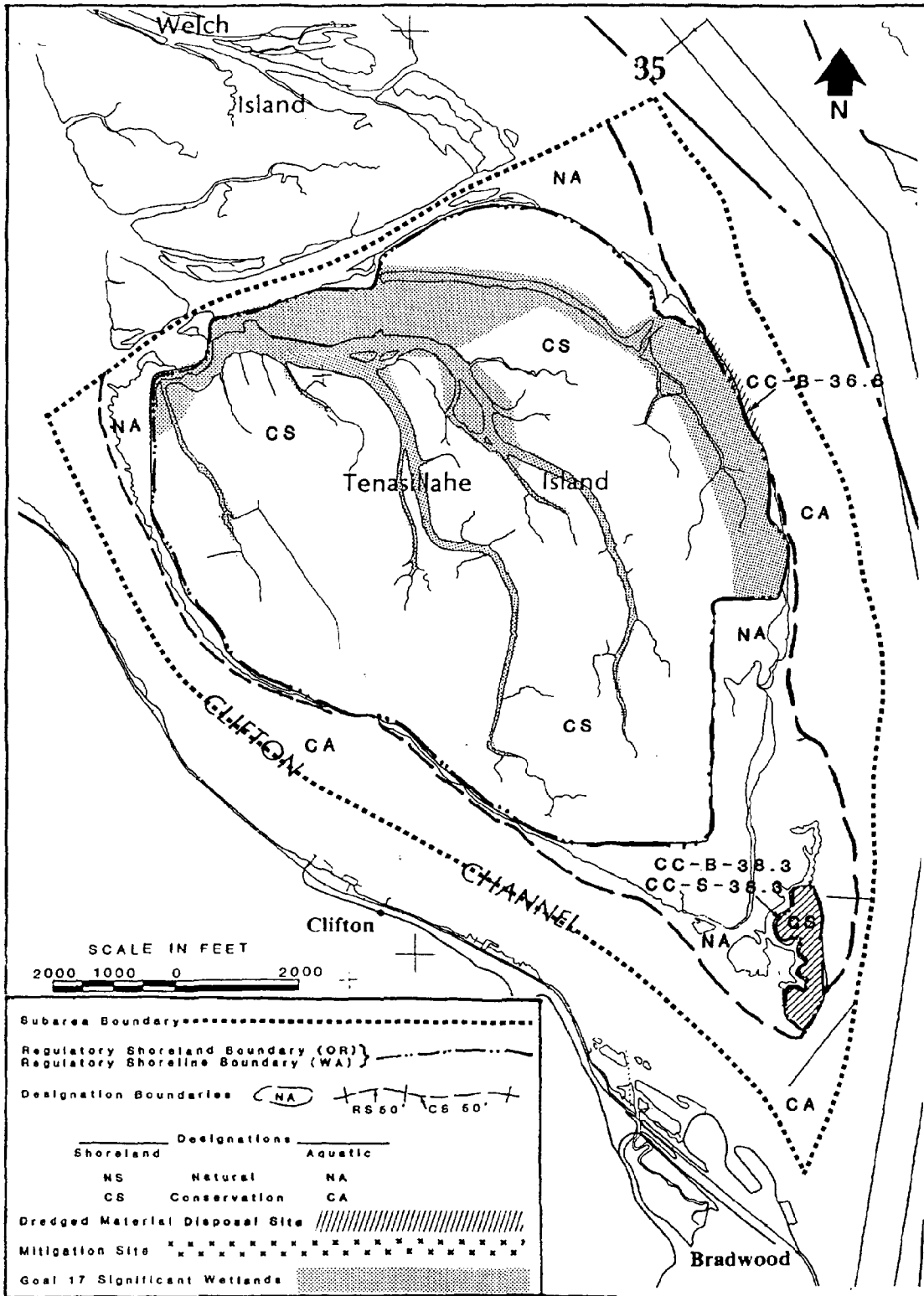
The waters of Multnomah Slough and other wetlands are Natural, except along Clifton Channel, where log storage sites are Conservation, and at the U. S. Fish and Wildlife Service boat dock, which is Conservation. The waters of the Main and Clifton Channels are classified Conservation.

The dikes and diked area of Tenasillahe Island is Conservation Shoreland. Much of the island is classified as a significant non-tidal wetland.

The entire diked portion of Tenasillahe Island and the small dredged material disposal island are included in the regulatory shorelands boundary.

#### 4.9.7. Subarea Policies

1. Measures that increase or enhance public access opportunities to the Wildlife Refuge are encouraged.



4.9. Tenasillahe Island



#### 4.10. FORT STEVENS STATE PARK

##### 4.10.1. General Description

This subarea includes the northern portion of Fort Stevens State Park. The northern boundary is the 3-foot bathymetric contour to the west and the 20-foot bathymetric contour to the east. The Hammond Urban Growth Boundary is the eastern subarea limit. On the south and west the extent of estuarine wetlands and the South Jetty form the subarea boundary. Trestle Bay, Swash Lake, Clatsop Spit and the Fort Stevens State Park Historic area are included. The entire subarea lies within Clatsop County.

##### 4.10.2. Aquatic Features

The aquatic portions of this subarea consist of waters shallower than 20 feet below MLLW, the waters and wetlands of Swash Lake and Trestle Bay, and a salt marsh on Clatsop Spit. The subarea has changed substantially in the past century. All of the land west of Point Adams has accreted since the construction of the South Jetty. Trestle Bay was also formed by this accretion.

The physical and biological characteristics of the aquatic portion of the subarea outside of Trestle Bay are similar to those of the Estuary Channels and Mouth of the Columbia River Subareas.

Little is known about the physical characteristics of Trestle Bay. Circulation between the inner bay and main part of the estuary is partially restricted by the jetty. Salinity levels in the bay are similar to those in the surface waters of the adjacent channel area (see Estuary Channels Subarea Plan). Sediments in the inner bay consist of very fine sand, silt, and clay.

Plant types in Trestle Bay consist of phytoplankton, benthic algae, eelgrass, and brackish tidal marsh and swamp vegetation. Phytoplankton productivity has not been measured in the bay. Benthic microalgal productivity on the tidal flats ranges from high levels in the more protected inner portion of the bay to moderate levels in the outer bay. Sparse patches of eelgrass probably grow on the bay's tidal flats. Tidal marshes and swamps form a wide band along much of the bay's shoreline. Bulrush (Scirpus americanus) dominates the colonizing (lowest elevation) low marshes while Lyngby's sedge (Carex lyngbyei) dominates higher elevation low marshes. Swash Lake, a marshy area connected with Trestle Bay, contains low marshes consisting of bulrush (Scirpus validus), cattail (Typha angustifolia), and Lyngby's sedge. Creeping bent grass (Agrostis alba), aster (Aster subspicatus), and Pacific silverweed (Potentilla pacifica) dominate the subarea's high marshes. The swamps consist of shrub and tree species. The salt marsh on Clatsop Spit has a direct hydrologic connection with the ocean. Vegetation in the marsh includes pickleweed and saltgrass.

Little information exists on the invertebrates of Trestle Bay. Zooplankton and epibenthic organisms have not been studied and benthic infauna have only been sampled at one site in the outer bay. The principal taxa in the single infauna sample were marine worms (Neanthes limnicola), oligochaetes, clams (Macoma balthica), and amphipods (Eohaustorius esuarius).

Fish species found in Trestle Bay are similar to those found in the adjacent channel area (see Estuary Channels Subarea Plan ).

Trestle Bay is a feeding, nesting, and wintering site for many species of birds. Migratory waterfowl, particularly swans, canvasback, scaups, surf scoter, ruddy duck, wigeon and bufflehead utilize the bay during their spring and fall migrations and winter in the bay. The largest nesting colony of double-crested cormorants in the estuary exists on rows of pilings that formed the trestle adjacent to the bay's rock jetty. Double-crested cormorants nest in spring, summer, and fall, and feed in the bay year round. Shorebirds and great blue heron feed on the tidal flats and in the low marshes of the bay.

Aquatic and terrestrial mammals utilize the marshes and swamps of the bay; however, mammal use is low compared to upriver wetlands. Several muskrat dens have been found along the tidal channels of the low and high marshes. In addition, beaver colonies have been found in nontidal areas adjacent to the bay. Nutria, raccoon, and deer also utilize the subarea's marshes and swamps.

#### 4.10.3. Shoreland Features

The shorelands of Clatsop Spit are rolling foredunes stabilized by European beachgrass. Coastal strawberry, early hairgrass, scotch broom and shore pine are also present. These species also characterize the shoreland vegetation along Trestle Bay; other shrubs, some willow, and alder are also present. Large tracts of nontidal wetland classified as significant under Oregon Statewide Planning Goal 17 are present in the subarea. These wetlands have formed in the deflation plans between the dunes. The shorelands also consist of river beach, rock riprap (original starting point of south jetty) and some shrub vegetation.

The subarea has significant bird and wildlife values, including a large roosting site for sanderlings on Clatsop Spit. Snowy plovers inhabit the ocean beach areas in this subarea. The area is important for waterfowl, wading birds, shorebirds and raptors, as well as deer, elk, nutria, mink, beaver, raccoon and opossum.

#### 4.10.4. Human Use

The intensity of human use in the Fort Stevens subarea varies widely. Most use centers around the park facilities and the three parking lot areas on Clatsop Spit and around the Historic Area.

Sightseeing, clamming, bicycling, hiking, beachcombing, nature observation, and jetty and beach angling are common activities. Drift logs are used for firewood. There is some illegal off-road use of the area by off-road vehicles, even in the salt marsh adjacent to the observation tower.

The cumulative impact of jetty construction on this area has been substantial. The South Jetty has resulted in large shoreland areas where there was open water prior to jetty construction.

#### 4.10.5. Issues

Development potential of the area is restricted to recreation and historic preservation. The Clatsop Spit area is already developed as far as it is intended to be.

Erosion problems along Clatsop Spit just south of the South Jetty, use of the area by four-wheel drive vehicles, removal of beach logs, and the possibility of ocean waves breaching the spit south of the jetty are issues of concern.

#### 4.10.6. Aquatic and Shoreland Designations

Aquatic area designations for Trestle Bay and its wetlands, and for the wetland-salt marsh area on Clatsop Spit are Natural. Other aquatic areas are Conservation.

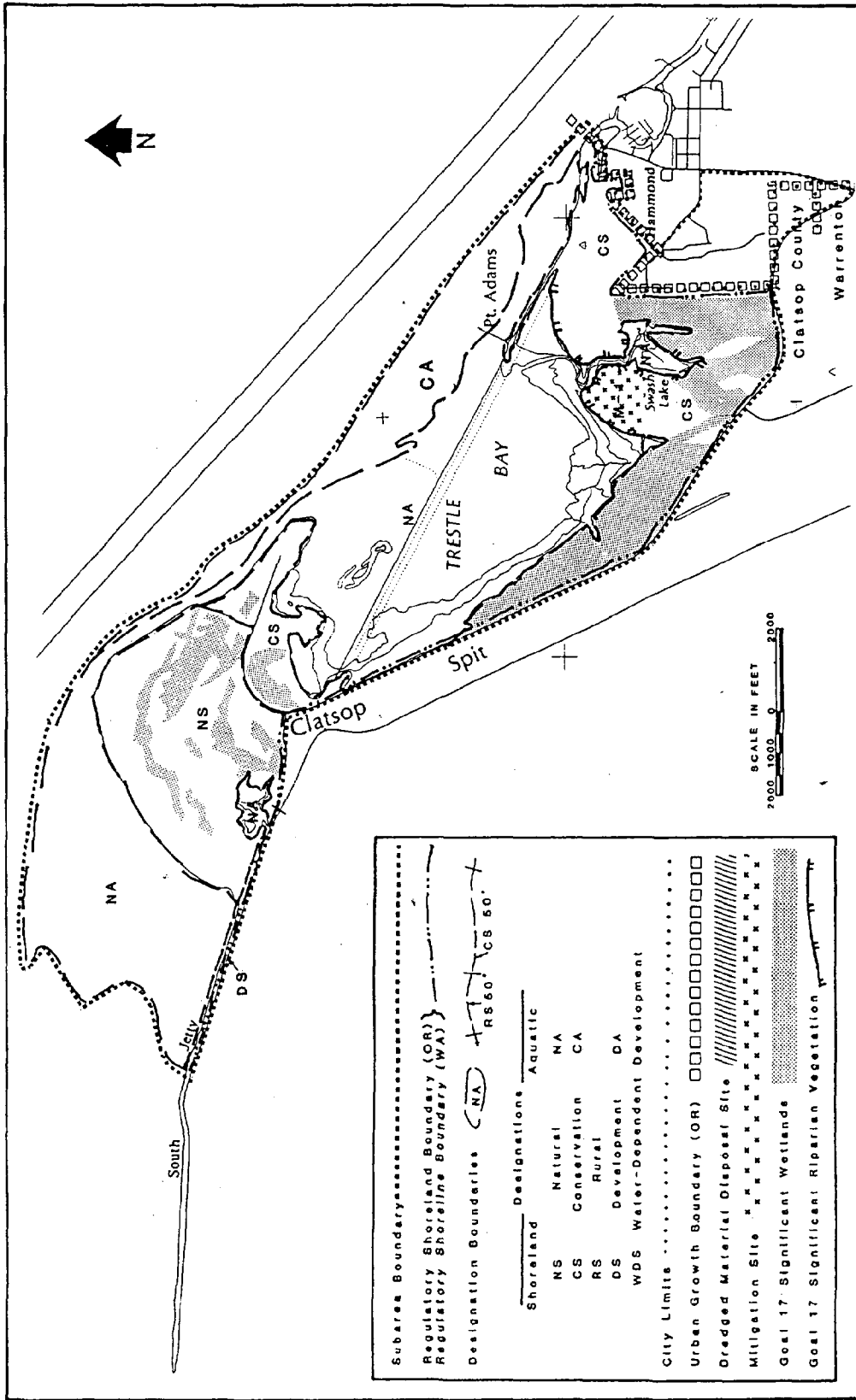
The shoreland areas of Clatsop Spit are designated Natural and Conservation. The three developed parking areas are considered to be consistent with the Conservation designation. The South Jetty is classified as Development from Point Adams to its outer end. The shoreland area from Hammond northwest to Swash Lake is designated Conservation.

The regulatory shoreland boundary includes the northern part of the spit and all lands east and north of Jetty Road to the eastern subarea boundary. The shoreland includes:

1. Significant wetlands and riparian vegetation as described by Duncan Thomas in Significant Shoreland and Wetland Habitats in the Clatsop Plains and the Columbia Floodplain of Clatsop County, OR (1986).
2. Swash Lake mitigation site described in the Columbia River Estuary Mitigation and Restoration Plan.

#### 4.10.7. Subarea Policies

1. Off-road vehicles should not be permitted on dune or wetland areas in the park and shall not traverse the Natural wetland-salt marsh on Clatsop Spit.



Subarea Boundary .....	
Regulatory Shoreland Boundary (OR) .....	
Regulatory Shoreline Boundary (WA) .....	
Designation Boundaries (NA) RS 60 CS 60	
Shoreland	Designations
NS	Natural
CS	Conservation
RS	Rural
DA	Development
WDS	Water-Dependent Development
City Limits .....	
Urban Growth Boundary (OR) .....	
Dredged Material Disposal Site .....	
Mitigation Site .....	
Goal 17 Significant Wetlands .....	
Goal 17 Significant Riparian Vegetation .....	

4.10. Fort Stevens State Park

## 4.11. HAMMOND

### 4.11.1. General Description

This subarea includes aquatic area and shorelands within the Town of Hammond and its urban growth boundary. The boundaries are the town limits on the east, Fort Stevens Highway on the south, the urban growth boundary on the west and the 20-foot bathymetric contour on the north. The subarea is entirely within the Town of Hammond. A small portion of the Town, between the 20-foot bathymetric contour and the navigation channel, is in the Estuary Channels Subarea.

### 4.11.2. Aquatic Features

Aquatic areas include the Hammond Mooring Basin, the beach, and adjacent waters of the Columbia River out to the 20-foot bathymetric contour. Aquatic physical and biological characteristics are similar to those in the adjacent channel (see Estuary Channels Subarea Plan).

The Hammond Mooring Basin varies from about 20 feet below MLLW at the entrance to an intertidal mudflat on the east side. The Basin's currents are slow and sediments consist primarily of silt and clay.

There is little information about the biological characteristics of the boat basin aquatic area. A 1978 benthic infauna study found densities of invertebrates to be relatively high.

### 4.11.3. Shoreland Features

The Hammond shorelands include relatively high areas of sandy soils (Westport fine sand), some areas of sandy dredged material, and lower wetland areas. Most of the shoreland area is developed. There is a forested and wetland area in the western part of the subarea adjacent to Fort Stevens State Park. The wetland is classified as significant under Oregon Statewide Planning Goal 17. Wildlife use in the forested and wetland area is high.

### 4.11.4. Human Use

Residential, commercial, industrial and recreational uses coexist along the Hammond waterfront. Along Pacific Drive there is a mix of commercial and residential uses. Commercial uses include boat charter offices, grocery stores, and gasoline service stations. Residential uses predominate north of Pacific Drive, east of the boat basin. The Hammond mooring basin and support facilities, encompassing an area approximately twenty-seven acres in size, are located inside the town

limits on the west. The mooring basin is primarily used by recreational fishing vessels. It is in heavy demand for both launching and mooring during the salmon fishing season.

The shoreline west of the mooring basin is a popular viewpoint and is readily accessible by car. The town's main commercial area is located several blocks south of the mooring basin. The mooring basin and adjacent shorelands are not yet fully utilized. Because of the view and close access to the river, the recreational and aesthetic value of these shorelands is high. A condominium development was constructed on the waterfront near Point Adams in the early 1980's. Commercial development since adoption of the original CREST plan in 1979 has been limited to construction of a fire station, a boarding house, and several offices.

The cumulative impact of bank protection efforts is significant in this subarea. Nearly the entire subarea shoreline is ripped, except for the shoreline inside the mooring basin.

#### 4.11.5. Issues

The major potential conflict in this area is between the very high water-dependent development potential along the riverfront and continued residential and recreational uses of the area. The other major issue is how to capitalize on the potential of the mooring basin to stimulate the Town's economy.

The development potential along the waterfront is the principal reason for the designation of the area east of Point Adams Packing as Water-Dependent Development. The designation prevents new residential development in the area and provides for future industrial tax base expansion.

The CREST marina study (1978) projected a demand for 800-900 new moorages in the estuary area with a 6-7% increase in demand each year. Demand decreased substantially in the early 1980's because of changes to the recreational and commercial fishing seasons, and the "El Nino" event of 1982-83. The Hammond boat basin receives very intensive use during certain seasons of the year. Present plans include creation of a waterfront park in the southeast corner of the mooring basin, increasing mooring basin capacity, and improvements to parking and visitor facilities. Its proximity to the river mouth fishing grounds, its location adjacent to a large state park, and the extensive area of undeveloped land around the basin make this a very high priority area for marina expansion. However, expansion of the mooring basin would require dredging 10-15 acres of intertidal mudflats. Dredging of the intertidal flats would require estuarine mitigation. Since there are no sites in the immediate area for restoration of equivalent habitat, the site at Swash Lake (Fort Stevens Subarea) or sites in Youngs Bay should be utilized. Use of the Swash Lake site for mitigation in connection with expansion of the Hammond boat basin may be difficult. The Oregon Transportation Department, which owns the site, has adopted a policy restricting use of the site for mitigation to state highway projects.

Dredged material disposal sites are needed for the boat basin. The 1986 Columbia River Estuary Dredged Material Management Plan identifies three sites for dredged material disposal within the Urban Growth Boundary. The sites have an estimated total remaining capacity of 195,000 cubic yards. The mooring basin is also pursuing the option of flowlane disposal. However, this option may involve substantial costs and post-disposal monitoring. The dredged material disposal site with the greatest remaining capacity (Ha-S-7.6) may contain nontidal wetlands that fall within Federal Section 404 or Oregon State Fill-Removal regulatory jurisdiction.

Erosion is a problem between the boat basin and the end of the railroad right-of-way. The bankline along the abandoned railroad is ripped. Review of navigation charts published over the last 40 years indicates that naturally-occurring deep water in this reach is moving closer to shore. Boat docks extending into the river provide evidence; much of the National Marine Fisheries Service and Bar Pilots docks were lost in 1985-1986.

The National Marine Fisheries Service Research Station shorelands adjacent to the beach, the beach itself east to Point Adams Packing and the adjacent waters are important recreational areas. These values are preserved by the Conservation designation.

#### 4.11.6. Aquatic and Shoreland Designations

The aquatic area is designated Conservation except for:

1. The aquatic area between Point Adams Packing and the east Town limits, which is designated Development between the shoreline and the subarea boundary.
2. The Mooring Basin, which is designated Development.

The shoreland area is designated Development, except for:

1. A Water-Dependent Development area between the east Town limits and Fleet Street, from the shoreline back to the regulatory shoreland boundary excluding a 100-foot deep strip north of Pacific Drive.
2. A Conservation area at the northern undeveloped part of the National Marine Fisheries Service research station.

The regulatory shoreland boundary is the area north of Fort Stevens Highway and Pacific Drive. It includes the following features:

1. Dredged Material disposal sites Ha-S-7.6, Ha-S-8.0, and Ha-S-7.9, identified in the 1986 Columbia River Estuary Dredged Material Management Plan.
2. Mitigation site M2 identified in the Columbia River Estuary Mitigation and Restoration Plan.



3. A wetland classified as significant under Oregon Statewide Planning Goal 17.

#### 4.11.7. Subarea Policies

1. The shoreland area between the eastern town line and the western-most property line of Point Adams Packing is designated Water-Dependent Development to accommodate water-dependent uses as the highest priority of use. In order to minimize the impacts on existing residences and preserve the unique potential of the area, the following policies apply:
  - a. Notwithstanding the fact that existing residences are a nonconforming use, in the event of complete destruction by fire or other disaster, the residences may be rebuilt, subject to the nonconforming use requirements of the Hammond Zoning Ordinance.
  - b. As feasible, new industrial development should be located so as to efficiently utilize land area and minimize conflicts with existing residences.
  - c. Fills in the aquatic portions of this subarea shall be allowed only in conjunction with bulkheading, riprapping or quay construction along the present shoreline, or in connection with restoration of an eroded shore. Filling shall not be allowed for the purpose of creating new land area.
2. The Development area around the boat basin leased from the Corps of Engineers (north of 3rd Street) shall be restricted to uses which are dependent on or related to operation of the boat basin. The Development area south of 3rd Street is also needed for water-oriented uses, but zoning in this area may also allow for other commercial uses such as motels, hotels, restaurants, etc., if they can demonstrate they provide a needed service for users of the boat basin. Existing residences may be maintained or rebuilt, as in Policy 1, above.
3. Development of a waterfront park adjacent to the Hammond Boat Basin shall minimize impacts to the marsh vegetation in the basin.
4. If a new boat ramp for the basin is proposed, consideration shall first be given to the south west side where dredging would be minimal, and where there is adequate parking for trailers and vehicles.
5. The provision of public access in all private development projects bordering the Columbia River shall be encouraged. Existing public access, including rights-of-way and public easements shall be maintained or replaced.



#### 4.12. TANSY POINT/ALDER COVE

##### 4.12.1. General Description

This subarea lies entirely within the City of Warrenton. It includes aquatic areas in Alder Cove, Tansy Creek and the Columbia River out to the pierhead line, and shorelands adjacent to the Columbia River and south to Tansy Creek. The western boundary is the Warrenton city limits. The southern boundary extends to include the boundary of the Mediation Panel Agreement area, and designated dredged material disposal site, Tansy Creek and the dike around Alder Cove.

##### 4.12.2. Aquatic Features

The aquatic features of this subarea include the Columbia River and the Alder Cove wetlands. Alder Cove was once part of Youngs Bay but was separated from the bay when the Skipanon Peninsulas were created. The aquatic area north of Tansy Point drops off relatively quickly from the shoreline to about 40 feet deep at the pierhead line. Alder Cove consists primarily of intertidal areas with a shallow channel running from the Alder Creek tidegate to the northeast side of the cove.

The currents along the Tansy Point shoreline are very swift because much of the river's flow is channeled through the main navigation channel. In addition, Tansy Point is on an outside bend of the river where currents are typically strong. Depending on river flow and tidal conditions, salinity levels in the deep bottom waters along Tansy Point range from 0 to 33 parts per thousand. The salinity in Alder Cove probably mirrors that of the Tansy Point surface waters where the range is from 0 to 30 parts per thousand.

River bottom material along Tansy Point is primarily coarse sand; finer materials are kept suspended by strong currents, waves and ship wakes. Sediments in Alder Cove range from fine sand near the mouth of the cove to silts and clays in the cove's interior. Erosion is occurring on the west spit of the Skipanon peninsula adjacent to this subarea and just south of Tansy Point in Alder Cove. From Tansy Point west to the Warrenton City Limits, two pile dikes and riprap help retard shoreline erosion.

Tidal marshes along Alder Cove are similar to those in Youngs Bay (see Youngs Bay Subarea Plan). Lower elevation marshes are dominated by softstem bulrush (Scirpus validus) while higher elevation marshes are dominated by Lyngby's sedge (Carex lyngbyei) and cattail (Typha angustifolia). Benthic diatom productivity on the mudflats of Alder Cove is very high.

Invertebrates studied in the subarea include zooplankton and benthic infauna. Zooplankton off the mouth of Alder Cove are very abundant. The copepod Eurytemora affinis can exceed 100,000 animals per

square meter of water surface. Benthic infauna have been sampled on the mudflats of Alder Cove. Infauna found at the site include amphipods (Corophium salmonis) and worms (oligochaetes and polychaetes). The total abundance of these organisms was found to be very high. Juvenile Dungeness crab use the deep channel habitat as a nursery area.

Fish utilization of the Tansy Point subarea is similar to the adjacent channel (see Estuary Channels Subarea Plan).

Several bird species, particularly the fish-eaters, utilize the subarea. In the river area, bird utilization is similar to the adjacent channel (see Estuary Channels Subarea Plan). The marshes and tidal flats of Alder Cove provide habitat for migratory waterfowl, especially swans, canvasback, scaups, and scoters. These birds are abundant in winter and during their spring and fall migrations. The western grebe, another migratory species, is very abundant in the subarea and uses Youngs Bay and Alder Cove as a staging area before its spring migration. Shorebirds utilize the tidal flat and low marsh habitats during all seasons but are most abundant during their spring and fall migrations. Great blue heron feed in the tidal flats and marshes.

Marine mammals utilize the channel off Tansy Point as a feeding area. Harbor seals feed in the subarea year round and California sea lions use the subarea primarily in spring.

Aquatic and terrestrial mammals utilize the marshes of Alder Cove; however, mammal use is low compared with upriver wetlands. Muskrat and nutria use the low and high marshes for feeding and denning. Beaver are not common in the lower estuary because of the lack of swamp habitat; however, beaver utilize the upland areas and adjacent high marshes of Alder Cove. Raccoon feed in the high marsh habitat of the subarea.

#### 4.12.3. Shoreland Features

The shorelands of this subarea include the primarily developed area from the Hammond/Warrenton boundary to NW 13th Street just south of Tansy Point, and the undeveloped area from NW 13th to Tansy Creek. Also included is the partially developed area south and west of Warrenton Drive. Along the Columbia River, shorelands are relatively high in elevation and soils are Westport fine sand and fill. South and west of Warrenton Drive and adjacent to Tansy Creek, the shorelands are low and poorly drained silty clay loams. The topsoil is underlain by a relatively thick layer of sand (approximately 200-250 feet through most of the subarea). The water table is at or near the surface. The shoreline from Tansy Point west is riprapped to retard erosion.

Vegetation on the undeveloped area between NW 13th and Tansy Creek includes Sitka spruce forested areas, some forested and shrub nontidal wetlands, and some upland areas dominated by shrub species. As of the date of this Plan, the precise boundaries of the nontidal wetlands have not been determined. The area south and west of Warrenton Drive consists of some forested areas and pastures comprised of upland grasses

and common rush (Juncus effusus). The undeveloped areas of the subarea support some wildlife including small mammals, deer and many bird species.

#### 4.12.4. Human Use

Low density residential, recreational and industrial uses all occur on the shoreland areas around Tansy Point. There are residences, industrial activities and vacant land between Tansy Point and the western city limits. An Industrial Park at Tansy Point contains a log sorting, processing and chipping operation. A barge moorage facility has been proposed for the Industrial Park. Two access roads have been constructed from Warrenton Drive to the Industrial Park. Railroad service to Tansy Point was abandoned in 1986.

A City Park (Eben Carruthers Memorial Park) has been developed along the Columbia River waterfront on one of three parcels of land at Tansy Point deeded to the City of Warrenton by Eben and Nancy Carruthers. The Park is presently undeveloped, but off-street parking and an interpretive display are planned.

The Alder Cove marshes receive some recreational and hunting use. Warrenton sewage lagoon effluent drains into the cove. Otherwise, human use of Alder Cove is minimal. The Port of Astoria owns tidelands outside the dike on the south and west sides. Cavenham Lumber Company owns tidelands adjacent to the peninsula on the west bank of the Skipanon River.

The cumulative impacts of previous developments have been substantial in this subarea. Diking, riprap, and the separation of Alder Cove from Youngs Bay have all significantly altered the subarea.

#### 4.12.5. Issues

Alder Cove tidal marshes and flats are widely recognized as a unique area. The Nature Conservancy has identified it as a potential natural area, because of its value to fish and wildlife and its historical use as a recreational area. The existing and potential development adjacent to the Cove, and the secondary sewage treatment effluent discharged into the Cove degrade its natural values somewhat.

Tansy Point has several unique features which make it especially suited for water-dependent development. The Lower Columbia River Ports Region Study, prepared by the Oregon Department of Transportation in 1975, and the 1977 Port of Astoria Master Plan identify the Tansy Point area as important to reserve for port development, as it is adjacent to the main ship channel. However, the Lower Columbia River Assessment of Oregon Deep Draft Sites (Ogden Beeman and Associates, 1986) did not select Tansy Point as a preferred site. This study cited the lack of rail service as a major disadvantage. However, this site remains

attractive for handling commodities not requiring rail service. Water depths close to shore are 50 feet or more, and the area is naturally scoured; however, the strong tidal currents which produce this scour effect represent a possible disadvantage for moorage. According to Columbia River Bar Pilots, this is not a serious problem for ships. However, it can be serious for barges. Originally known as the Town of Flavel, this area was once used for passenger steamship docking. Because of the natural scour and deep water, initial and maintenance dredging would be significantly less than at most other potential deep-draft ship development sites, particularly if the moorage were not directly adjacent to the shoreline.

The Tansy Point area also has potential for residential development. There is already low-density housing west toward the City limits and the park-like waterfront setting is aesthetically very desirable.

The City participated in the CREST Mediation Panel in order to resolve conflicts over the planning designations and uses permitted at Tansy Point. The consensus agreement reached during mediation by local governments and state and federal agencies provided for large-scale development of Tansy Point for a water-dependent use. The agreement contained a list of findings regarding the special suitability of Tansy Point for water-dependent development. These findings assumed continued rail service to the area; rail service has since been abandoned west of Astoria. The site has other advantages, including a naturally scoured deep-draft aquatic area adjacent to the shoreline, nearby highway access, relative proximity to the Columbia River mouth, a large amount of potential deep-water berthing frontage and significant amount of backup land area. The Mediation Panel Agreement designated the aquatic and shoreland areas adjacent to Tansy Point for water-dependent development.

#### 4.12.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The aquatic area bounded by the shoreline on the South, the pier-head line to the North, the Hammond/Warrenton boundary line on the West and Tansy Point at the Pacific Shrimp pier on the East.
2. The aquatic area on the East side of Tansy Point proposed for barge moorage.
3. The flowlane disposal area south of the main channel (600 feet wide or to the 20-foot bathymetric contour, whichever is narrower).

The following aquatic areas are designated Conservation:

1. The area at the southern end of Alder Cove where effluent from the Astoria sewage ponds is discharged.

2. The mouth of Alder Cove from the 3-foot bathymetric contour north to the flowlane disposal area.

A Natural designation is applied to the remaining aquatic area within Alder Cove.

All shoreland areas are designated Water-Dependent Development, except for a portion of dredged material disposal site Wa-S-9.4, which is designated Development.

The regulatory shoreland boundary is 50 feet from the Columbia River estuary shoreline, or from the landward toe of dikes and associated toe drains, whichever is greatest, except where it extends further inland to include the following features:

1. The industrial park area (containing the log sorting, processing, and chipping operation and the barge dock) on Tansy Point, designated Water-Dependent Development by the 1981 Mediation Panel Agreement.
2. The area zoned Water-Dependent Development bounded by Railroad Drive on the West, Tansy Creek on the south, the Columbia River on the north and Alder Cove on the east.
3. Mitigation site M3 from the Columbia River Estuary Restoration and Mitigation Plan.
4. Dredged material disposal site Wa-S-9.4 from the Columbia River Estuary Dredged Material Management Plan (1986).
5. The significant wetland at Tansy Creek.

#### 4.12.7. Subarea Policies

(Policies 1 through 7 are from the Mediation Panel Agreement for Tansy Point.)

1. In the 3.5-acre parcel, a waterfront recreational park is consistent with the Water-Dependent Development designation.
2. The 8-acre parcel can be developed for single-family residential use only after a major portion of the 26-acre and 72-acre parcels together are committed for a large acreage water-dependent use. It is understood that a large acreage water-dependent use may not need the entire 98 acres. Commitment includes the following: (1) agreement with a user, (2) aggregation of ownership or development rights, (3) relocation/improvement of highway (if needed), and (4) land clearing and initial construction activities.
3. The 8-acre and 3.5-acre parcels may be developed at any time for any water-dependent use, to include a waterfront recreational park.

4. The 26-acre and 72-acre parcels are to be developed together (98 acres) for a large water-dependent industrial use. However, the City may prohibit storage and transshipment of bulk coal/ore on these two parcels if Warrenton, Astoria, Clatsop County and the Port agree (by virtue of a coordinated comprehensive estuary plan) to allow bulk coal ore uses at the east Skipanon or Tongue Point, or other lower Columbia River sites. If, during a scheduled update of the Columbia River Estuary Plan, it is determined that needs for large-scale water-dependent uses have changed such that this large parcel is no longer needed for large acreage water-dependent uses, the City may, through a plan amendment, redesignate the area for other water-dependent uses, and the 8-acre parcel for single-family residential use.
5. Temporary uses, or other uses which do not preclude large water-dependent use of the combined 26-acre and 72-acre parcels or any portion thereof, may be allowed.
6. The City of Warrenton and the Town of Hammond may cooperatively change the shape of the 26-acre and 72-acre parcels by adding lands in Hammond and deleting lands in Warrenton so long as 2,000 feet of continuous river frontage, and the overall size of 98 acres are maintained or expanded.
7. The 10-acre and the 11-acre parcels north of N.W. 14th Street extended to the shoreline on the north and the dike on the east are designated Water-Dependent Development to provide for the continued development of the existing types of small water-dependent uses.
8. Notwithstanding the fact that residences within the Water-Dependent Development shorelands of this subarea are a non-conforming use, reconstruction may be allowed in the event of destruction by fire or other disaster in accordance with the non-conforming use regulations of the Warrenton Zoning Ordinance.
9. The Aquatic Natural tideflats and marshes of Alder Cove shall be protected from alterations (note: the tidal marsh approximately 7.8 acres in size on the East side of Alder Cove was designated Aquatic Development by the 1981 Mediation Panel Agreement). Such protection, however, should not preclude intensive development of the adjacent Water-Dependent Development or Development shorelands nor necessary dike maintenance.
10. Large-scale fills are not appropriate in the Development Aquatic portions of this subarea. Filling shall be allowed only for bulkheading or quay construction along the present shoreline. No substantial parcels of new land shall be created. The potential for impacts or tidal and nontidal wetlands shall be evaluated during development review. Prior to development approval, the Corps of Engineers and Oregon Division of State Lands must be consulted to determine if the site contains wetlands within their respective regulatory jurisdictions.





#### 4.13. NORTH WARRENTON

##### 4.13.1. General Description

This subarea is entirely shorelands. It is bounded by Tansy Creek on the north, the dike adjacent to Alder Cove on the northeast, N.E. Skipanon Drive on the east and N. W. Warrenton Drive on the south and west. It includes rural, residential and commercial areas in the City of Warrenton.

##### 4.13.2. Shoreland Features

Shorelands in this subarea include primarily low elevation undeveloped diked lands. Alder and Tansy Creeks run through the subarea and empty into Alder Cove through a tidegate. The Warrenton sewage lagoons are on the east side of the subarea.

Most of the shorelands consist of either alder and spruce forested areas or pasture land comprised of upland grasses and common rush (Juncus effusus). Some of these areas are nontidal wetland. As of the date of this Plan, the precise boundaries of the nontidal wetlands have not been determined. Alder and Tansy Creek are classified as significant wetlands under Oregon Statewide Planning Goal 17.

The forested and pasture areas probably receive high wildlife use. Bird use of the sewage lagoons is also high.

##### 4.13.3. Human Use

Residential and rural uses predominate except immediately adjacent to downtown Warrenton, where there is some commercial development. The Warren House on Skipanon Drive is a State Historical Landmark. There is a recreational vehicle park adjacent to Tansy Creek. Immediately adjacent to this subarea on the east is the Cavenham Lumber Mill. There is residential development along N. E. Skipanon Drive south of the Cavenham Lumber Mill, as well as along Warrenton Drive. The City of Warrenton's two sewage lagoons are located south of Alder Cove and west of N. E. Skipanon Drive. A dike borders the sewage lagoons to the north and east.

##### 4.13.4. Issues

The subarea does not have navigational access to the Columbia River or the Skipanon River. The parcel between the dike and the old railroad right-of-way, to the north and west of the sewage lagoons, is owned by the Cavenham Lumber Company and may be used for expansion of their

facilities. Other areas have considerable potential for residential development, except perhaps the low-lying lands between Alder and Tansy Creeks.

An issue in this subarea (and others adjacent to the Burlington Northern Railroad right-of-way) is the change in potential development patterns due to abandonment of the railroad (tracks were removed in 1987). In addition, much of the undeveloped portion of this subarea contains wetlands under the jurisdiction of state and federal regulatory agencies.

#### 4.13.5. Shoreland Designations

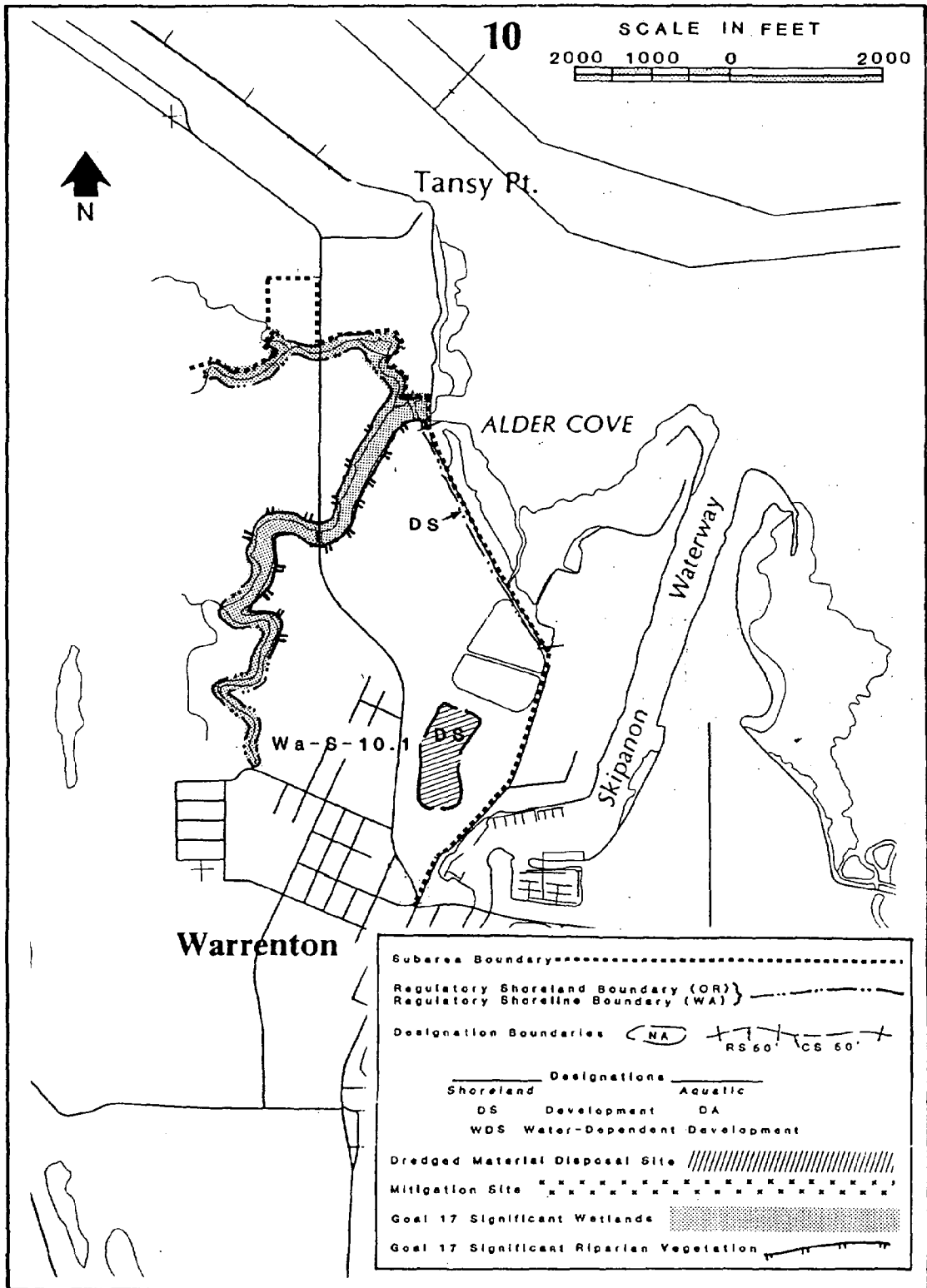
All of the shorelands in this subarea are designated Development, except for Alder Creek and Tansy Creek which are designated Conservation.

The regulatory shoreland boundary is 50 feet from the Columbia River Estuary shoreline or the landward side of dikes and associated toe drains, whichever is greatest, except where it extends farther inland to include the following features:

1. Dredged Material Disposal site Wa-S-10.1 from the Columbia River Estuary Dredged Material Management Plan (1986).
2. Alder and Tansy Creek, significant Oregon Statewide Planning Goal 17 wetlands and surrounding riparian vegetation.

#### 4.13.6. Subarea Policy

1. Widening and strengthening of the dike to enable its use by heavy vehicles shall be allowed on the shoreland side of the dike, except along the sewage lagoons. If fill is required on the Alder Cove side of the dike, other than fill or riprap associated with normal dike maintenance, an exception will be required to Oregon Statewide Planning Goal 16's prohibition fill in aquatic areas for non-water-dependent uses.



4.13. North Warrenton

#### 4.14. MIDDLE SKIPANON RIVER

##### 4.14.1. General Description

This subarea includes shorelands on both sides of the Skipanon River, diked lands east of the Skipanon and the aquatic areas between the Harbor Drive Bridge and Highway 101. Although parts of downtown Warrenton and a major shopping center are included, the subarea is largely vacant land, residential or low density commercial and light industrial. The entire subarea lies within the Warrenton City limits.

##### 4.14.2. Aquatic Features

The estuarine aquatic portion of this subarea includes the Skipanon River below the 8th Street dam. The river above the dam does not receive free tidal flow from the estuary and is therefore considered a shoreland feature.

The average fresh water flow of the Skipanon River is only about 50 cfs. The circulation in the reach below the 8th Street dam is dominated by tidal currents and flushing is poor (flushing time: 10 to 38 days). Water quality in the Skipanon River below the dam ranges from poor to moderate. During late summer low flow periods, severe depletion of dissolved oxygen has been observed. Water quality is degraded by industrial wastes, boat traffic, fish wastes and non-point water pollution sources.

Biological characteristics of the Skipanon are similar to those in the lower parts of the river described in the Mouth of the Skipanon Subarea Plan. Estuarine wetlands include two small forested and shrub tidal swamp islands south of Harbor Drive, and some small tidal marshes on the inside meanders of the river.

##### 4.14.3. Shoreland Features

The shorelands consist primarily of low, poorly-drained silty clay loams protected by dikes along both sides of the Skipanon River and along Youngs Bay and Alder Cove. The area west of the Skipanon River is a developed residential and commercial area. Much of the shoreland east of the Skipanon River consists of pasture or shrub and forested area. There are houses along Harbor Drive and Marlin Avenue and a large shopping center between Holbrook Slough and Highway 101. Rivers and sloughs in the shorelands include the Skipanon River upstream from the 8th Street dam, Skipanon Slough, and Holbrook Slough.

The sloughs, Skipanon River and large tracts of wetlands along the river are classified as significant under Oregon Statewide Planning Goal

17. The wetlands along the Skipanon are primarily Sitka spruce swamps. Other parts of the subarea may also contain nontidal wetlands. As of the date of this Plan, the boundaries of these wetlands have not been determined.

Wildlife values in this subarea are high in the sloughs and adjacent wetlands and low in the developed areas.

#### 4.14.4. Human Use

Lands west of the Skipanon River are in residential and commercial uses. The lands east of the river are largely vacant and without road access or utilities. Residential, commercial, agricultural and light industrial uses are scattered along Harbor Drive and Highway 101. Water and sewer are available along the major roads. Timber value is low, but there is some farmland. Zoning is Residential, Commercial and Light Industrial. Land ownership is mostly private, much in large holdings, with some public ownership. The area around the intersection of Highway 101 and Harbor Drive is developing into a major regional commercial district. An existing shopping center and two planned facilities are in this area.

The cumulative impact of diking on this area has been substantial. Nearly all of the area was intertidal swamp or marsh prior to dike construction.

#### 4.14.5. Issues

Development potential east of the Skipanon River is limited by the flood hazard and poor soils. Any portion of the area that could be filled with dredged or other material could be developed, however.

The Skipanon River South of the Harbor Drive Bridge has significant potential for the development of marinas for recreational boats if facilities can be designed to minimize further degradation of water quality. A public boat ramp has been installed just upstream of the bridge on the east side of the River.

Construction of marina facilities above the Harbor Drive Bridge would provide needed moorage for recreational boats and enable some of the moorage facilities north of the bridge to convert from recreational to larger commercial fishing vessel use. However, a constraint for marina development are the marsh islands and fringing marshes in the Skipanon River. Marina development may require major alteration of the islands and fringing marshes, which is inconsistent with Oregon State-wide Planning Goal 16 restrictions against major alterations in Conservation Management Units. If a marina or other development proposed for the Middle Skipanon would require major alteration of the islands or fringing marshes, the City of Warrenton will, at that time, consider

taking an exception to the Statewide Planning Goal. Another potential constraint to marina development above the Harbor Drive Bridge is the limited vertical clearance (17 feet).

#### 4.14.6. Aquatic and Shoreland Designations

The marsh islands and fringing marshes in the Skipanon River between the Harbor Drive bridge and the 8th Street dam are designated Conservation. The remaining aquatic areas from the Harbor Drive Bridge to the 8th Street dam are designated Development.

All of the shorelands of this subarea are designated Development, except the river from the 8th Street dam south to the end of the subarea which is designated Conservation.

The regulatory shoreland boundary is 50 feet from the shoreline or the landward side of dikes and associated toe drains, whichever is greatest, except where it extends farther inland to include the following features:

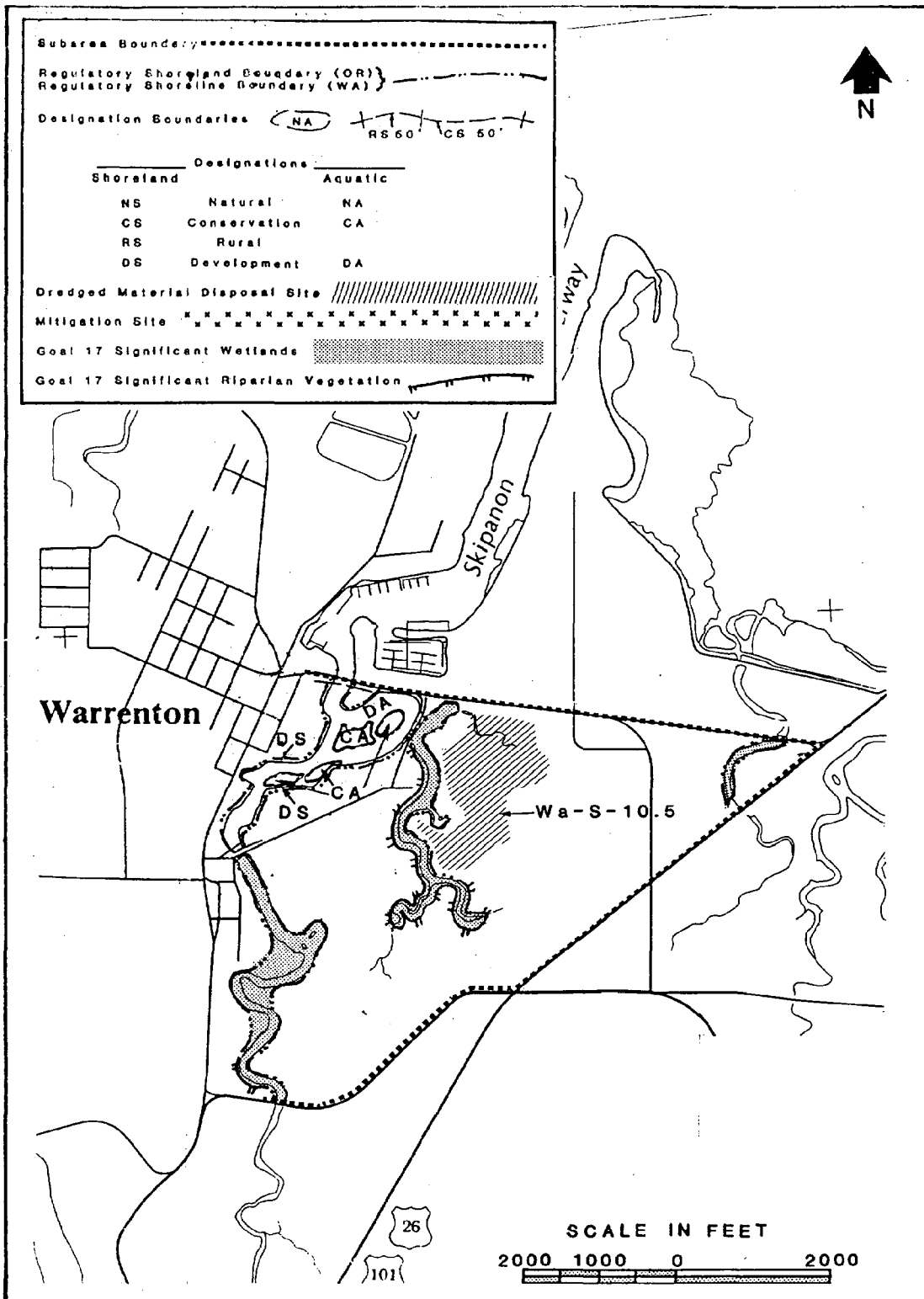
1. Dredged material disposal site Wa-S-10.5 from the Columbia River Estuary Dredged Material Management Plan (1986).
2. The following wetlands classified as significant under Oregon Statewide Planning Goal 17: Skipanon River above the 8th Street dam and associated wetlands, Skipanon Slough, and Holbrook Slough.
3. Significant riparian vegetation around Skipanon River upstream of the 8th Street dam and Skipanon Slough.

#### 4.14.7. Subarea Policies

1. Development along the east shoreline of the Skipanon River between Harbor Drive and 8th Street shall include a Tourist/Commercial mixture of water-dependent, water-related and other uses.
2. The Aquatic Development designation of the Middle Skipanon is provided to accommodate marina development and other water-dependent and water-related uses as the highest priority of use. Non-water-dependent uses are not appropriate in the aquatic portions of this subarea.
3. The water quality impacts of development in the Middle Skipanon will be evaluated prior to approval of projects, particularly in the area between the 8th Street dam and the Harbor Drive Bridge. Alterations which have a decidedly negative water quality impact or result in a decrease in the flushing rate will not normally be permitted.

4. If a marina or other major development proposed for the Middle Skipanon would require major alteration of the islands or fringing marshes, the City will consider taking an exception to Oregon Statewide Planning Goal 16.





4.14. Middle Skipanon River

#### 4.15. MOUTH OF THE SKIPANON RIVER

##### 4.15.1. General Description

This subarea contains the filled and diked shorelands north of Harbor Drive and east of Skipanon Drive, the Skipanon River from the Harbor Drive Bridge to its mouth, the East and West Skipanon Peninsulas, and adjacent Columbia River waters out to the navigation channel. Parts of downtown Warrenton are also included. The subarea lies within the Warrenton City limits, with the exception of the aquatic area between the pierhead line and the navigation channel.

##### 4.15.2. Aquatic Features

Aquatic areas in the Mouth of the Skipanon Subarea include the Skipanon River downstream of the Harbor Drive Bridge, the Warrenton Boat Basin, wetlands along the northern portions of the west and east peninsulas, and a portion of the Columbia River extending from the Skipanon mouth to main navigation channel. The Skipanon River originally drained into Youngs Bay approximately 3,500 feet upstream of its present mouth. The Skipanon Peninsulas were created by fill during the late 1920's - 1930's when the Skipanon channel was dredged. These large fills have severed Alder Cove from Youngs Bay and caused the Skipanon River to empty into the main channel of the Columbia River, rather than into Youngs Bay. The peninsulas were previously tidal marshes and mudflats.

The Skipanon Channel has an authorized depth of 30 feet below MLLW. It is currently dredged to a depth of 14 to 20 feet below MLLW, but shoals to as shallow as 9 feet. From the mouth of the river to the main navigation channel, the water depth increases from 20 to 40 feet. The Warrenton Boat Basin is 10 feet deep.

The 8th Street dam effectively divides the Skipanon River into two bodies of water. Except during the winter months, fresh water flow in the Skipanon River is low (average flow 50 cfs). Salinity intrusion occurs in the river whenever salinity is present in the adjacent Columbia River waters. Salinity ranges up to about 25 parts per thousand. Despite the low fresh water flow, strong vertical differences in salinity occur during the fall and bottom waters may become stagnant.

Near the mouth of the river, the sediments are largely clean sand. The proportion of fine material, organic matter and wood debris increases in the upriver direction. Sediments in the river has been found to contain low concentrations of metals.

The tidal marshes in the subarea include a low elevation marsh on the west side of the West Peninsula, and a large marsh extending eastward as much as 1,800 feet on the east side of the East Peninsula. The dominant marsh plants are softstem bulrush (Scirpus validus) at lower elevations, and Lyngby's sedge (Carex lyngbyei) at higher elevations. The tidal marsh on the East Peninsula grades upward into a nontidal

wetland dominated by common rush (Juncus effusus). The production of non-vascular benthic plants (diatoms and other algae) ranks among the highest in the estuary on the tidal flats and low marshes on the east side of the subarea.

Invertebrates studied in the subarea include zooplankton, benthic infauna and epibenthic organisms. Zooplankton off the mouth of the Skipanon are very abundant. Densities of the copepod Eurytemora affinis can exceed 100,000 animals per square meter of water surface. Benthic infauna have been sampled in the Skipanon River adjacent to the Warrenton Boat Basin and on the mudflats east of the East Peninsula. Infauna found at the Skipanon River site include amphipods (Corophium salmonis) and worms (oligochaetes). The total abundance of these organisms was found to be much lower at this site than in adjacent areas of Youngs Bay and Alder Cove. The mudflat site near the East Peninsula had primarily amphipods (Corophium salmonis) in very large numbers (in excess of 30,000 animals per square meter). The mudflats on the eastern part of the subarea are among the richest in the estuary in terms of epibenthic invertebrates. Sand shrimp are particularly abundant.

The Skipanon River has not been sampled for fish. Juvenile salmonids are released from a small hatchery on the river operated by Warrenton High School. The area east of the East Peninsula is used by many of the same fish species found in Youngs Bay (see Youngs Bay Subarea Plan). Wildlife use of the subarea's waters and wetlands are also similar to Youngs Bay (see Youngs Bay Subarea Plan).

#### 4.15.3. Shoreland Features

The shorelands of this subarea include the primarily developed West Peninsula and vicinity, the mooring basin, and the primarily undeveloped East Peninsula. Soils are sandy or freshwater marsh soils.

Vegetation on the northern half of the East Peninsula consists of upland grasses and Scotch Broom in the higher spots and nontidal wetland dominated by common rush in the lower (eastern) part. The southern half of the peninsula consists of some upland grasses and a great deal of common rush. Between the East Peninsula and Highway 101 the shoreland vegetation varies, consisting of upland grasses, common rush, blackberries, and various shrubs.

The shorelands on the southern half of the East Peninsula have several small sloughs which drain through a tidegate into the Skipanon River. Holbrook Slough, a larger slough which drains through a tidegate into Youngs Bay, is classified as a significant wetland under Oregon Statewide Planning Goal 17.

Use of the subarea by terrestrial mammals is low because of the lack of vegetative cover. Some deer can be found in the subarea. Abundant land birds include swallows, marsh wren, and common yellowthroat.

#### 4.15.4. Human Use

The West Skipanon Peninsula has been heavily impacted by development. It includes the area bounded by N. E. Skipanon Drive on the southwest, the Burlington Northern right-of-way on the south, the bank of the Skipanon River on the east, and Alder Cove on the northwest and north. The West Peninsula contains a number of diverse and potentially conflicting uses, many of which are dependent upon the Skipanon waterway. Private moorages exist across from the boat basin on the shore adjacent to the Port Warren Condominiums. Several residences are located along N.E. Skipanon Drive in this area. A seafood processing plant with its own loading dock and moorage is located adjacent to the Port Warren Condominiums on the north. The shore is mostly riprapped along this section of the West Peninsula. The Cavenham Lumber Mill, occupying the greater part of the West Peninsula's land area, lies further to the north. The lumber mill has its own barge loading facilities and moorage on the waterway, and occupies approximately 125 acres. The greater part of the Cavenham Lumber Mill site is used for log storage and loading. The south portion contains the lumber processing, warehouse, and office facilities. At the north tip of the West Peninsula there is a low marsh and narrow upland area which is now undeveloped but could eventually be filled. The area was designated Water-Dependent Development by the 1981 Mediation Panel Agreement and could potentially be developed as a log export facility. The upland area is included as a lower priority dredged material disposal site in the 1986 Columbia River Estuary Dredged Material Management Plan. The railroad tracks which ran approximately parallel to Harbor Drive and along N.W. Main to the north were abandoned in 1986.

The East Skipanon Peninsula includes that area bounded by the Warrenton Boat Basin and Harbor Drive on the south, Highway 101 and the fringe marshes on the east, the Skipanon waterway to the west, and the Columbia River to the north. The East bank of the Skipanon is primarily undeveloped, with the exception of the Boat Basin and associated facilities on the south end of the subarea. Much of the bank is diked. An extensive low marsh borders the peninsula on the east. The boundary of the wetland area under federal jurisdiction was staked out and surveyed in 1985. There is a designated dredged material disposal site on the East Skipanon Peninsula. This site may contain nontidal wetlands, which may reduce fill capacity. The upland areas are primarily pasture.

#### 4.15.5. Issues

This area contains both industrial sites of great value and significant natural resource values. Both peninsulas of the Skipanon River are especially suitable for water-dependent industry. There are sizeable parcels of vacant land in both public and corporate ownership. The adjacent Skipanon River has an authorized channel. The main navigation channel of the Columbia River is immediately accessible. There is no railroad access, however.

The adjacent aquatic areas here contain important natural resource values. Both Alder Cove and Youngs Bay are believed to make significant contributions to the fisheries resource, particularly salmon.

The East Peninsula of the Skipanon River has been intensively studied for its development potential and the impacts of development on natural resource values. In connection with a proposed oil rig fabrication facility on the peninsula, an environmental impact statement and a mitigation study was completed in the late 1970s. A Mediation Panel Agreement between federal and state agencies and local governments was reached in 1981 that provided for designation of Aquatic and Shoreland areas for both water-dependent development and conservation. The East and West Peninsulas were included in that Agreement. The great majority of the uplands on the East Peninsula were designated Water-Dependent Development to accommodate one or several large projects which would require access to the Skipanon River channel and/or the Columbia River navigation channel. In the event that the fringe marsh on the east side of the East Peninsula is proposed to be filled, a mitigation area west of Holbrook Slough in the southeast part of the East Peninsula would be created. Most of the East Skipanon Peninsula is designated as a dredged material disposal site.

The East Peninsula of the Skipanon is considered suitable for a bulk shipping facility or heavy water-dependent industrial uses. Deep-water access may be obtained via the Skipanon River or through a pile-supported accessway north of the peninsula. If deep-water access is obtained via the Skipanon River, it may be necessary to create berth space by excavating existing uplands on the east peninsula due to the narrowness of the river and location of the navigation channel.

The West Peninsula of the Skipanon River is presently occupied by Cavenham Forest Industries. This largest employer in the City of Warrenton has continued to make substantial investments in its facilities. Expansion plans for this development have been discussed. They may involve the development of a 2-berth log and lumber shipping facility on the Skipanon River.

The 1981 Mediation Panel Agreement designated twenty acres of aquatic and shoreland area for Development to provide for a log/lumber export facility. Of these 20 acres, about 7.8 acres are in the aquatic area of Alder Cove. Mitigation for the aquatic fill would need to be provided as part of project approval.

The West Peninsula of the Skipanon River also has significant potential for deep-draft access directly on the Columbia River. Natural 40-foot water depths occur about 1,600 feet from the end of the peninsula. There is ample space for maneuvering and docking large ships. The proximity of this site to the ocean and the excellent condition of the 40-foot channel downstream means that the site is one of few locations where, by judicious use of tides, vessels drawing in excess of 40 feet could be accommodated. As such, the site could provide the required mooring capability for economically shipping or receiving bulk cargoes

in vessel sizes significantly greater than those using other port sites on the Columbia River or in Oregon.

Further development in this subarea raises questions of water quality in the Skipanon River. Water quality in the Skipanon River is marginal during summer months. Increased dredging, river traffic, storm runoff and boat moorage coupled with decreased flushing caused by enlarging the channel could result in significantly poorer water quality.

The surface area of the Skipanon River is quite limited. It is not known how much small boat traffic could be increased without causing congestion problems and interfering with industrial operations. Highway traffic congestion is already a problem in downtown Warrenton. More industrial development at the mouth of the Skipanon River may increase traffic congestion there and on Highway 101. Increased small boat moorage would also increase congestion and result in a need for additional parking spaces. The East and West Skipanon Peninsulas were not chosen as preferred sites for future deep-draft development in the Lower Columbia River Assessment of Oregon Deep Draft Sites (Ogden Beeman and Associates, Inc., 1986). The study cited lack of rail service and distance to the channel as disadvantages. However, these sites remain attractive for handling commodities not requiring rail service.

#### 4.15.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The entire Skipanon waterway between the Harbor Drive Bridge and the main navigation channel.
2. Approximately 25 acres of tidal marsh on the east side of the East Peninsula (development alternative I of the Mediation Panel Agreement).
3. Approximately 7.8 acres of tidal marsh and flats on the west side of the West Peninsula.
4. The flowlane disposal area south of the main channel (600 feet wide or to the 20-foot bathymetric contour, whichever is narrower).

The following aquatic areas as designated Conservation:

1. The subtidal area between the 3-foot bathymetric contour and the main navigation channel east of the Skipanon Channel.
2. The aquatic area between the shoreline and the main navigation channel west of the Skipanon Channel.

The following aquatic areas are designated Natural:

1. Remaining tidal marshes and flats east of the East Peninsula (development alternative I of the Mediation Panel Agreement) or all tidal marshes and flats east of the East Peninsula (development alternative II of the Mediation Panel Agreement).

The following shoreland areas are designated Development:

1. The area adjacent to the mooring basin east to N.E. Iredale Avenue.
2. The area just north of Harbor Drive on the east side of the Skipanon waterway.
3. An area on the south side of the West Peninsula.
4. The area east of Holbrook Slough.

All other shorelands are designated Water-Dependent Development.

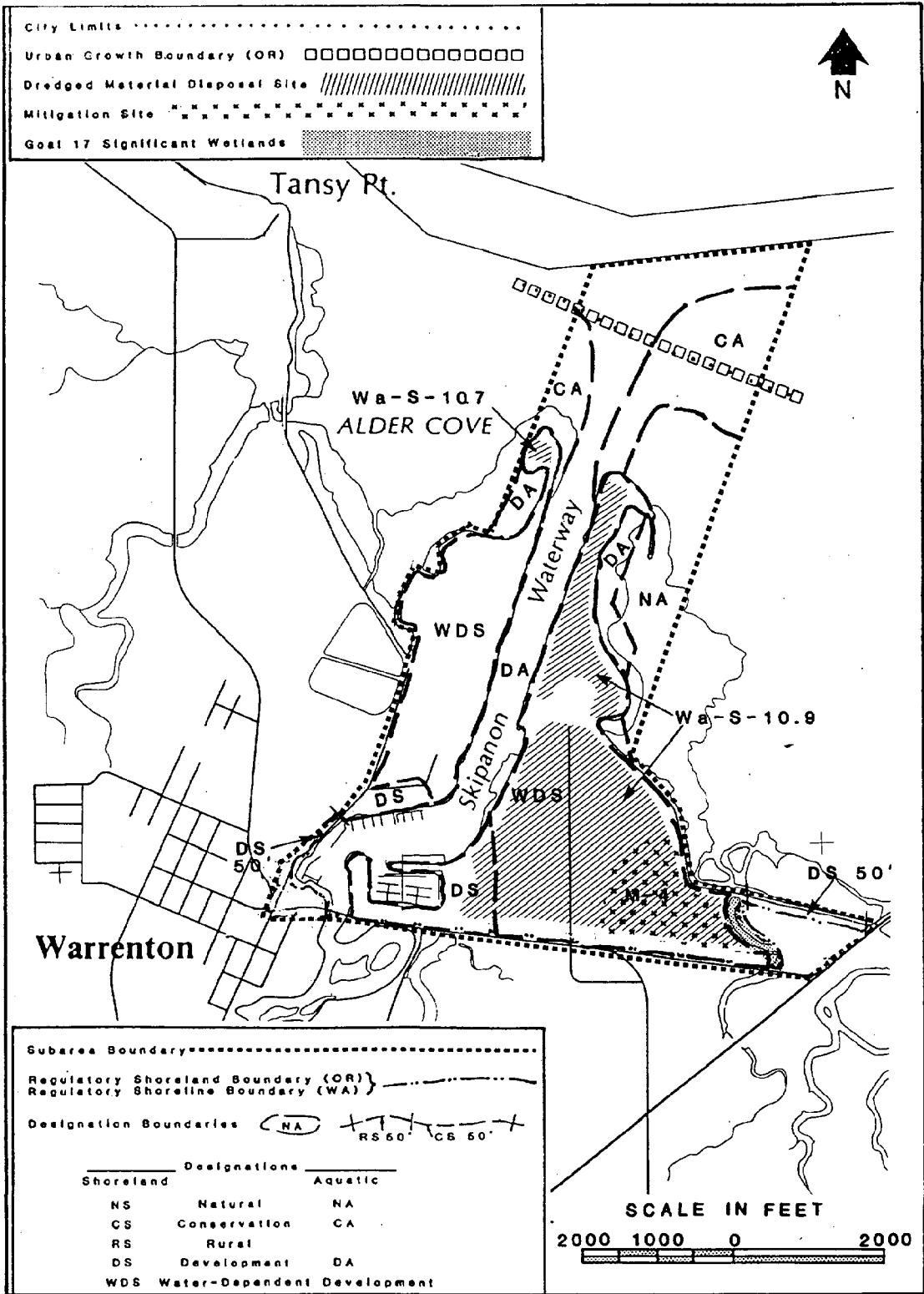
The regulatory shoreland boundary is 50 feet from the Columbia River estuary shoreline, or the landward toe of dikes plus associated toe drains, whichever is greatest, except where it extends farther inland to include the following features:

1. The East Skipanon Peninsula containing:
  - (a) The 172-acre area designated Water-Dependent Development by the Mediation Panel Agreement.
  - (b) The area east of Holbrook Slough to Highway 101 described as suitable for mitigation/restoration by the Columbia River Estuary Mitigation and Restoration Plan.
  - (c) Dredged material disposal site Wa-S-10.9 from the Columbia River Estuary Dredged Material Management Plan.
2. The West Skipanon Peninsula, including:
  - (a) All upland adjacent to Alder Cove and east of N. E. Skipanon Drive, with the exception of the area designated commercial by the City of Warrenton Zoning Ordinance.
  - (b) Dredged material disposal site Wa-S-10.7 from the Columbia River Estuary Dredged Material Management Plan.
3. The following wetland classified as significant under Oregon Statewide Planning Goal 17: Holbrook Slough.

#### 4.15.7. Subarea Policies

1. Development of shorelands and adjacent aquatic areas on the East and West Peninsulas of the Skipanon River shall be carried out so as to minimize adverse environmental impacts on productive tidal marshes, mud-sand flats, wildlife, fisheries and other important natural values of Youngs Bay and Alder Cove. Site planning shall include provision for vegetative buffers and other means for shielding the developed areas from adjacent marshes and flats.
2. Existing and new uses which are associated with wood processing and handling shall be allowed in the Water-Dependent Development area on the West Peninsula of the Skipanon River.
3. The Development designations for aquatic areas along both sides of the Skipanon are provided to accommodate future water-dependent uses. However, the designations do not create the presumption that dredging, filling or other alterations will be permitted automatically. Specific proposals for water-dependent development must be justified in terms of available alternatives, public need and economic benefits, minimize adverse impacts on water quality and natural habitat and meet other regulatory requirements.





4.15. Mouth of the Skipanon River

## 4.16. YOUNGS BAY

### 4.16.1. General Description

Youngs Bay is one of the more biologically productive parts of the estuary. This subarea extends from the old Highway 101 bridges over the Youngs River and the Lewis and Clark Rivers to the 20-foot bathymetric contour adjacent to the navigation channel of the Columbia River. It includes large fringing marshes, tideflats, open water, and restored wetlands at the Airport Mitigation Bank. The subarea boundary follows the shoreline, except adjacent to the Port of Astoria and the East Peninsula of the Skipanon River. No shorelands are included. Youngs Bay is in Warrenton, Astoria and Clatsop County.

### 4.16.2. Aquatic Features

Because of numerous development proposals, Youngs Bay is the most intensively studied bay of the estuary. The area has been considerably altered by human activity. The most important physical alterations have been diking of tidal marshes and spruce swamps, the filling of shallow areas, and the alteration of the hydraulics of the bay by channels, fills and causeways. Youngs Bay originally extended from Tansy Point to Smith Point, but the peninsulas at the mouth of the Skipanon River have completely separated Alder Cove from Youngs Bay, though the systems remain similar in their biology. The strongest effects on the bay's hydraulics have been exerted by the Skipanon peninsulas, the fills at Smith Point (Port of Astoria piers) and bridge causeways. The new Highway 101 causeway in particular has caused a marked reduction in currents and wave action in the interior of Youngs Bay. There has been extensive shoaling. Much of the diked Airport and Jeffers Gardens areas were previously tidal marshes and swamps connected with Youngs Bay.

Tides in Youngs Bay and tributary streams are of the standing wave type. Thus, the tidal range increases somewhat from the port docks (8.0 feet) to the tidal reaches of the tributary streams (8.6 or 8.7 feet). High water is nearly simultaneous throughout the system and occurs at slack water. This type of tide is typical of shallow bays but atypical of the Columbia River Estuary.

Three water masses contribute to the circulation in Youngs Bay: Columbia River fresh water, tributary fresh water and marine water. Fresh water flow in the Columbia River is greatest during the spring freshet in June; winter freshets also occur. Youngs Bay tributary flow is strongest in December and January, when local rainfall is at a maximum. Intrusion of saline marine water is governed primarily by Columbia River flow and secondarily by tributary flow. Salinities in Youngs Bay rarely exceed 10 to 15 parts per thousand even in the fall. Under these conditions, the vertical salinity differences are pronounced and salinity may intrude upriver along the bottom as far as RM 10 in the Youngs River and RM 6 in the Lewis and Clark River. During high flow

periods for either the Columbia River or Youngs Bay tributaries, salinity is absent or nearly absent from Youngs Bay.

Current patterns in Youngs Bay are complex. Eddies and stagnant areas prevail in the shallows. Stronger currents are found in the deep areas. Currents are highly variable, depending on winds, tides, freshwater flow and salinity intrusion.

Water quality is generally good in Youngs Bay; no serious pollutant sources are present and the flushing is excellent. Flushing times for the bay itself have been estimated to vary from 1 to 2 days, depending on tide and freshwater flow conditions. The flushing time of the tributaries below the head of tide is slower; 3.3 to 16 days for the Lewis and Clark River and 2.3 to 7.8 days for the Youngs River. Water quality in some smaller tributaries and sloughs such as the Little Walluski River is less favorable because of the poor flushing.

Sediments in the subarea range from medium to fine sand in the central bay to very fine sand, silt, and clay on the tidal flats. Youngs Bay appears to experience alternating periods of sedimentation and erosion, with variations occurring on time scales from storm events and seasons to years and decades. Sedimentation predominates (average rate throughout bay 1 cm/yr) and most strongly so in the shallow areas (up to 6 cm/yr). These observations are confirmed by the historical changes over the last century.

Aquatic plant types in the Youngs Bay subarea include phytoplankton, benthic algae, and tidal marsh and swamp vegetation. Phytoplankton productivity is very low compared with the remainder of the estuary. Benthic algal productivity on the tidal flats and in the low marshes ranks among the highest in the estuary. Tidal flats along the west shore of Youngs Bay are particularly productive. Tidal marshes and swamps form a narrow fringe along most of the Bay's shoreline. Colonizing low marshes dominated by bulrush (Scirpus validus) account for about 50% of the low marsh area. The remaining low marsh are dominated by Lyngby's sedge (Carex lyngbyei) and are extremely productive. The high marshes consist of a mixture of several species of herbaceous plants and shrubs. Shrub species dominate the tidal swamps. A 33-acre diked area on the west side of the Lewis and Clark River mouth has been restored to tidal influence. This area is expected to develop low and high tidal marsh.

Invertebrate types that have been studied in the subarea include benthic infauna and epibenthic organisms. Benthic infauna densities rank among the highest in the estuary. Fish prey species such as amphipods (Corophium salmonis) and clams (Macoma balthica) are abundant in the infauna community. The epibenthic organism community in the subarea also ranks among the most abundant in the estuary. Key species include small copepods such as Eurytemora affinis and larger animals such as sand shrimp.

Youngs Bay is a feeding area for many species of fresh and salt water fish. The Bay is also a particularly important nursery area for the juveniles of many species. The marine demersal species English

sole, starry flounder, and Pacific staghorn sculpin utilize the bay as a feeding and nursery area. The English sole found in the bay are primarily subyearlings and are most abundant in the deeper habitats during the fall months. Abundant freshwater species in the subarea include threespine stickleback, peamouth, and prickly sculpin.

Pacific herring, shiner perch, and longfin smelt possibly spawn in Youngs Bay. Pacific herring spawn in the estuary from April through July. Yearling and older herring, however, are not abundant in the bay. Subyearlings become abundant in the bay in summer. Youngs Bay is more important as a nursery area than a spawning area for Pacific herring. Shiner perch bear their young in the estuary in June and July. Yearling and older perch become particularly concentrated in the bay during this period. Subyearling perch utilize the bay as a nursery area in summer and fall. Longfin smelt spawn in the estuary from November through March. Smelt ranging in age from yearlings through adults utilize Youngs Bay throughout the year and are abundant in fall. Larval longfin smelt appear in the estuary in winter and spring and subyearlings utilize the bay as a nursery area primarily in fall.

In addition to longfin smelt, several other anadromous species, including American shad and the salmonids, utilize the bay as a migration route and nursery area. American shad spawn in tributaries to the bay from June to August. Adult American shad migrate through the bay in June and July and juveniles in November and December. Because these spawning runs are relatively small, American shad are less abundant in Youngs Bay than in the main stem of the estuary. All of the salmonid species abundant in the estuary utilize Youngs Bay as a migration route or nursery area. Subyearling Chinook salmon utilize the bay as a nursery area year round and are abundant during their spring migration. These juvenile Chinook include populations which have migrated from upriver as well as from natural spawning areas and hatcheries in the tributaries of the bay. Yearling Chinook and coho and juvenile steelhead and cutthroat trout migrate through the bay primarily in spring. The yearling Chinook populations represent upriver stocks, while the coho and steelhead populations originate both upriver and in natural spawning areas and hatcheries in the bay's tributaries.

The Youngs Bay subarea provides habitat for several species of resident and migratory birds. Double-crested cormorant feed in the subarea year round while pelagic cormorant utilize the subarea primarily in winter. The marshes, tidal flats of the subarea provide habitat for migratory waterfowl, especially swans, canvasback, scaups, and scoters. These birds are abundant in winter and during their spring and fall migrations. The western grebe, another migratory species, is abundant in the subarea and uses Youngs Bay as a staging area before its spring migration. Mallard, a resident waterfowl species, utilize the subarea year round. Western and glaucous-winged gulls feed in the subarea year round. Shorebirds utilize the tidal flat and low marsh habitats during all seasons but are most abundant during their spring and fall migrations. Great blue heron feed in the tidal flats and marshes of the subarea year round. They are particularly abundant in spring and summer in association with their use during the nesting season of a rookery near the mouth of the Youngs River.

Aquatic and terrestrial mammals utilize the marshes of the subarea; however, mammal use is low compared with upriver wetlands. Muskrat and nutria use the low and high marshes for feeding and denning. Raccoon feed in the high marsh habitats of the subarea.

#### 4.16.3. Human Use

The primary uses are boating, recreational fishing, commercial fishing, log transport, and sailing.

The cumulative impacts of diking, shore protection, bridge construction and other human activity in Youngs Bay has been significant. Circulation, aquatic habitat and public access have all been affected.

#### 4.16.4. Issues

Youngs Bay is surrounded by Warrenton and Astoria. Several land use disputes have centered around proposed fills in Youngs Bay or uses of nearby shorelands that might have polluted the bay. Prime industrial sites on the shorelands adjacent to Youngs Bay include the East Peninsula of the Skipanon River and the Astoria Airport. These sites could be made larger by filling productive shallow areas.

The use of the bay and tributaries for fish propagation will probably also increase. The Clatsop Economic Development Committee's fisheries project on the north shore of the bay has been successful and is expanding. The physical characteristics of Youngs Bay, including good water quality, adequate depth at certain sites, and access to shoreland sites make it particularly suitable for aquaculture.

A major limitation on development of shorelands adjacent to Youngs Bay to the west is the limited land transportation system. Navigational access to the Youngs Bay shoreline is limited by fringing tidal marshes, shallow water and the high shoaling rate. Commercial use of the bay in the near future will probably be limited to log transport and fishing. Recreational boating and fishing will probably increase. There is a need for support facilities along the shore of Youngs Bay for recreational and commercial fishing vessels. The salmon gillnet fishery in Youngs Bay has increased in size in recent years, with rising production at the Oregon Department of Fish and Wildlife's Klaskanine Hatchery and the two Clatsop Economic Development Committee hatcheries on the south fork of the Klaskanine and on Tucker Creek. Youngs Bay gillnet fishermen participated in a system of voluntary assessments to pay for the Clatsop Economic Development Committee hatchery projects. The net pen project on the north shore of the bay is expected to substantially increase salmon runs.

Severe contamination of both upland and tidal flat sediments at the old Pacific Power and Light coal gasification plant on Youngs Bay was discovered in 1984. There was evidence of contamination of aquatic

organisms (not including fish) as well as groundwater contamination. The sampling identified carcinogenic polynuclear aromatic hydrocarbons (PAHs) and benzene as the contaminants of primary concern in the coal tars. A remedial action program was developed in coordination with the Environmental Protection Agency and the Oregon Department of Environmental Quality. The old PP&L Service Center building was demolished in 1985 and the rubble was disposed on-site, then covered with sand and several feet of topsoil. Warning signs were placed around the contaminated area. A two-year groundwater monitoring program has been implemented. The results have indicated mainly localized contamination of groundwater.

The dike adjacent to the airport runway designated for an instrument landing system, which once intruded into the clear zone of that runway, was moved waterward in 1984-85. Spruce and other vegetation from approximately one acre outside the present dike was also removed. This activity was mitigated by moving a portion of the dike landward and created new marsh area. An exception to the Oregon Statewide Planning Goal 16 was approved for this action.

A mitigation bank has been developed at the airport site near the mouth of the Lewis and Clark River. The site was created by building a new dike landward of the existing dike and removing the existing dike to expose a 35-acre area to tidal influence. The mitigation bank is administered by the Oregon Division of State Lands. The agreement reached on use of the bank stipulates that it may be used only for projects between Tongue Point and the Skipanon River.

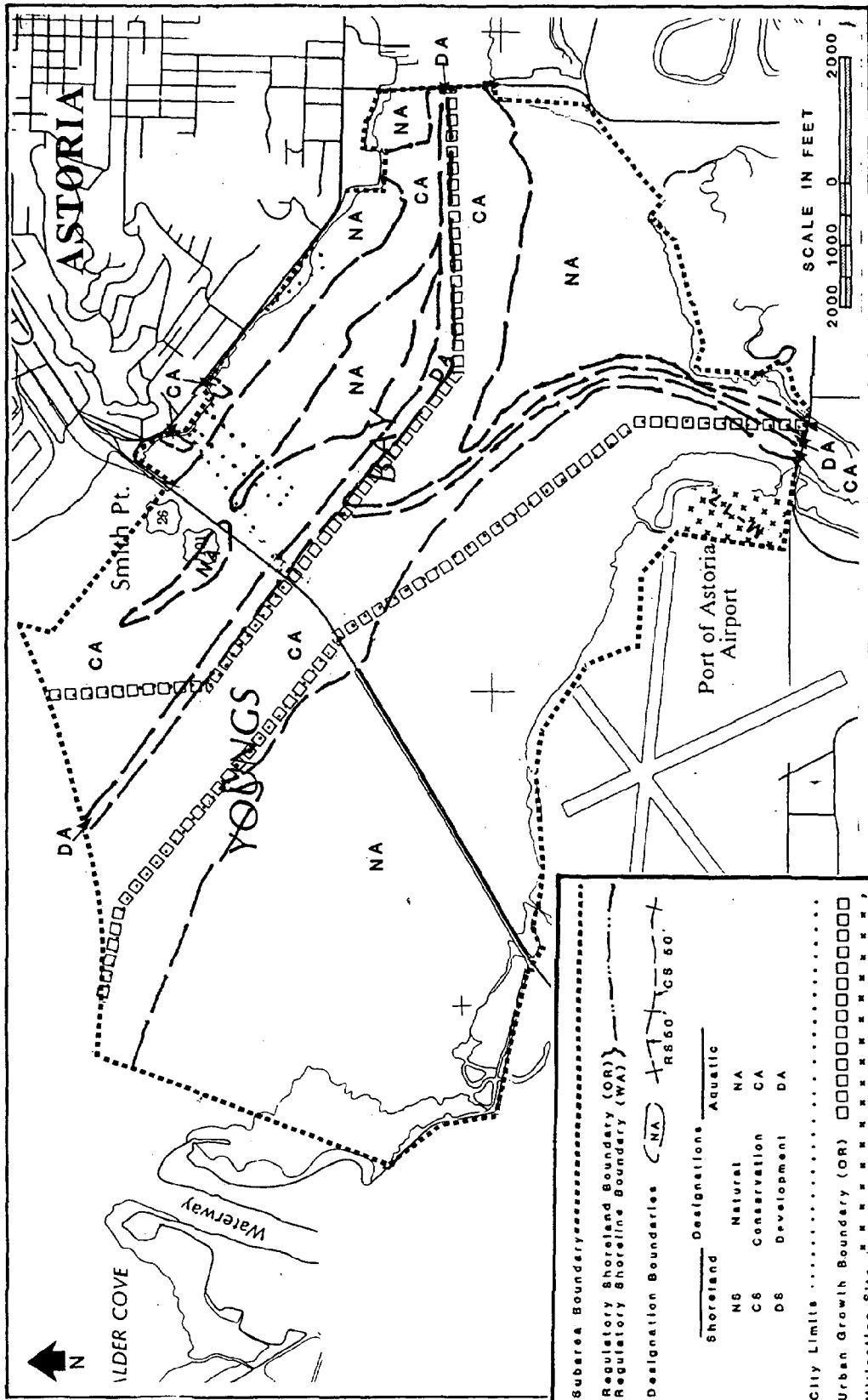
#### 4.16.5. Aquatic Designations

The authorized navigation channels are designated Development. The mud flats, tidal flats, and fringing marshes are designated Natural, except for areas adjacent to the old PP&L facility, the site of a former net storage building south of the new Youngs Bay Bridge, and the existing structure at the Columbia Boatworks, which are designated Conservation.

All other water areas are designated Conservation.

#### 4.16.6. Subarea Policies

1. Proposed developments shall be evaluated for their impact on existing aquaculture operations. Aquatic sites that are especially suitable for aquaculture development shall be reserved for that use wherever possible.
2. Development of the aquatic area adjacent to the old Pacific Power and Light facility shall be evaluated for its impacts related to contaminated sediments buried on-site. Potential exposure of coal tar pollutants from disturbance of contaminated sediments shall be avoided.



4.16. Youngs Bay

#### 4.17. AIRPORT AND VICINITY

##### 4.17.1. General Description

This subarea consists of diked shorelands that are part of or adjacent to the Port of Astoria Airport. The subarea is bounded by the shoreline on the north and east, Highway 101 to the northwest, and alternate Highway 101 on the south. The subarea lies within the Warrenton city limits and Urban Growth Boundary, except for an area between S.E. 11th and alternate Highway 101, which is outside the Urban Growth Boundary. There are no estuarine aquatic areas in this subarea.

##### 4.17.2. Shoreland Features

The entire subarea is protected by dikes. Prior to diking, the area consisted primarily of tidal marsh and swamp. With the exception of filled areas at the airport, the entire subarea is in the 100-year floodplain. The soils are fill material, Coquille-Tidal Marsh (fresh) - Clatsop Association and Walluski-Knappa Association. Developed areas include the airport and associated facilities, an industrial park, and a residential area on the west side of the subarea.

Vegetation in the higher areas includes alder, willow and Sitka spruce with a dense understory of blackberry. Much of the area around the airport and west to Highway 101 consists of grasses with locally dense areas of common rush (Juncus effusus).

Wetlands in the subarea include Vera Slough and some marshes in the lower areas. Vera Slough has been classified as significant under Oregon Statewide Planning Goal 17. The boundaries of other wetlands have not been determined as of the date of this Plan.

Wildlife use of the undeveloped portion of the subarea is high.

##### 4.17.3. Human Use

The major human uses are the airport, light industry, the Coast Guard base, agriculture, and rural residences. Agricultural suitability is poor to moderate. The major agricultural activity is grazing.

Transportation access is provided by new and old Highway 101. Because of the dike access problem and shallow water, there is no navigationally useful water access to the airport. Water and sewer service are provided by the City of Warrenton. The primary recreational use is hunting.



#### 4.17.4. Issues

The Airport is a valuable economic asset to the area. The Oregon Department of Transportation has recommended that regulatory measures be taken to protect present and future air operations. These measures should provide for airport-related uses and should prevent encroachment by residential uses. Use of the existing access road for airport-related uses has resulted in conflict with adjoining residences. Development of another access road to serve airport uses is needed. The Port of Astoria plans to develop a new access road to the industrial park. This road would require bridge crossing(s) over at least one slough and may involve wetland fill.

Much of the land adjacent to the runways is designated for dredged material disposal. These designated sites are distant from current dredging projects but may be useful for material trucked in. They were included in the Columbia River Estuary Dredged Material Management Plan (1986) as reserve (Priority 2) sites, to be used primarily for the Port of Astoria's projects.

#### 4.17.5. Shoreland Designations

The shoreland north of the railroad is designated Rural. East of Vera Creek, the shoreland within the Warrenton city limits is designated Development. Agricultural areas outside the Warrenton city limits are designated Rural and a small forested area is Conservation. West of Vera Creek to S.E. Pacific Avenue and Holbrook Slough is designated Rural. All clear zones at the ends of the airport runways are designated Rural. The creeks and sloughs are designated Conservation. The remainder of the subarea west to Highway 101 is designated Development.

The regulatory shoreland boundary in this subarea is 50 feet from the estuary shoreline, or from the landward toe of dikes and associated toe drains, whichever is greatest, except where it extends further inland to include the following features:

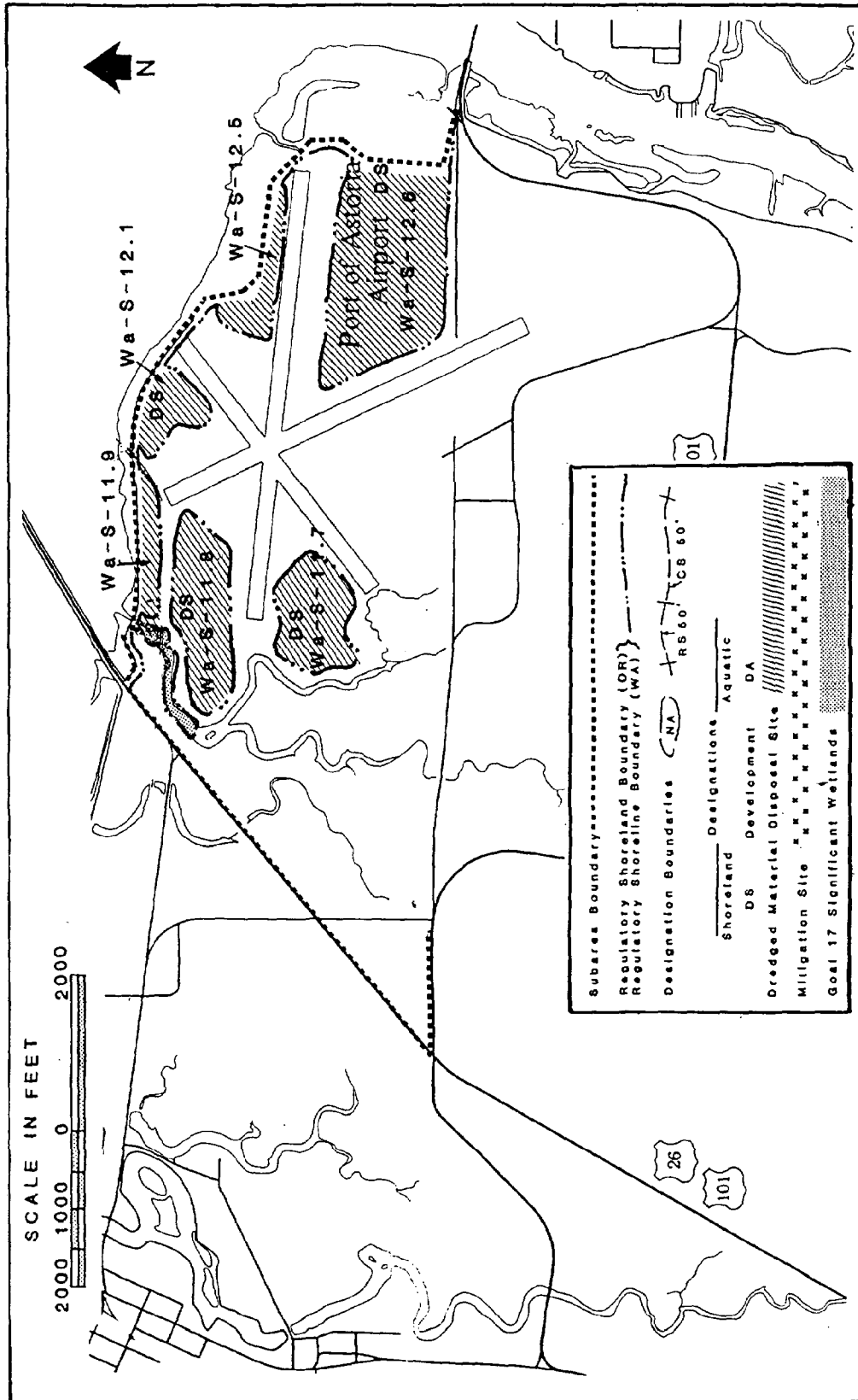
1. Vera Creek Slough extending 1,000 feet inland from the tidegate.
2. The following dredged material disposal sites from the Columbia River Estuary Dredged Material Management Plan:

Wa-S-12.6, Wa-S-12.5, Wa-S-12.1, Wa-S-11.9, Wa-S-11.8, and Wa-S-11.7.

#### 4.17.6. Subarea Policies

1. A new access road to serve airport uses should be developed. Filling of Holbrook and Vera Creek sloughs and damage to riparian habitat shall be minimized. An exception to Oregon Statewide Planning Goal 17 may be necessary.

2. New airport uses shall be designed and sited to minimize conflict with residences along the present access road. Potential circulation conflicts shall be evaluated.



4.17. Airport and Vicinity

#### 4.18. LEWIS AND CLARK RIVER

##### 4.18.1. General Description

This subarea includes the Lewis and Clark River and diked and floodplain areas on the Lewis and Clark River and tributary sloughs between the Alternate Highway 101 bridge and the head of tide. The subarea is within Clatsop County.

##### 4.18.2. Aquatic Features

The aquatic portion of the subarea consists of the Lewis and Clark River and the marshes fringing the river shore. Diking has brought about large changes in this subarea in the past century. Prior to diking activities, the river was flanked by broad tidal swamps. Most of the present fringing marshes along the river shore formed after the dikes were constructed.

The Lewis and Clark River has an annual average discharge of 255 cubic feet per second (cfs). Monthly average discharges can exceed 600 cfs in December and January, and are typically less than 100 cfs in summer and fall. Two-thirds of the total annual river discharge occurs during the period of December through March. Tidal flow reversals are evident as far upstream as Lewis and Clark River Mile 6 during low discharge periods and River Mile 2 during high discharge periods.

Salinity levels in the subarea depend on the salinity of Youngs Bay water and the volume of Lewis and Clark River discharge. Youngs Bay is freshwater during the spring and summer Columbia River, hence the Lewis and Clark River is freshwater. By late summer, the mouth of the Lewis and Clark River exhibits salinities of 1 to 2 ppt. In fall, salinities at the river mouth average 2 to 8 ppt and saline water intrudes to Lewis and Clark River Mile 6. In winter, the high runoff of the Lewis and Clark River prevents saline water from entering the river.

Sediments have been quantitatively sampled at two sites in the river. At Lewis and Clark River Mile 7.5, the sediments consist of medium and coarse gravel. The lower river sediments consist mainly of fine sand and silt.

Of the river's plant types, only phytoplankton and tidal marsh and swamp vegetation have been studied. Information on these plant types exists for the lower river only (to about RM 2.5). Phytoplankton productivity in the lower river ranks among the highest measured in the estuary. The lower river marshes are similar to those in Youngs Bay (see Youngs Bay Subarea Plan).

Invertebrate and fish species using the river are similar to those in Youngs Bay (see Youngs Bay Subarea Plan).

Several anadromous species are known to spawn in the river. American shad spawn in the upper portion of the river from June through August. Fall

Chinook spawn in August and September, coho from August through October, and steelhead from November through March.

Wildlife use of the subarea is similar to that in Youngs Bay (see Youngs Bay Subarea Plan).

#### 4.18.3. Shoreland Features

Most shorelands in this reach are low, diked lands in the 100 year floodplain. Soils are of the Coquille-Tidal Marsh (fresh) - Clatsop and Walluski-Knappa Associations. The soils are fair to good for agricultural use. Most of the land is or has been in agricultural production. There are few houses in the subarea.

Several tidegated sloughs drain the shorelands. These are significant wetlands under Oregon Statewide Planning Goal 17. In addition, emergent wetlands east of the Fort Clatsop Memorial are classified as significant.

Wildlife use of the shorelands is high.

#### 4.18.4. Human Use

Land uses include agriculture (largely grazing), rural housing, and the log dump owned by Cavenham Forest Products. Highway access is provided by Alternate Highway 101 and county roads. Water is private or provided by the Youngs River and Lewis and Clark Water District. There is no sewer system. The scenic value of the river is high. The Fort Clatsop National Memorial commemorates the winter headquarters of the Lewis and Clark Expedition. The major human uses of the waters are fishing, log sorting, storage and transport, and recreational boating. There are two active diking districts in the subarea.

The cumulative impact of dike construction on circulation and aquatic habitat has been substantial. Large areas in this subarea have been converted from marsh/swamp habitat into agricultural use.

#### 4.18.5. Issues

There is limited development potential because of the flood hazard, poor transportation network and distance from developed areas. Some housing development may occur on adjacent upland areas.

Dredging of the Lewis and Clark River channel (10 feet deep and 150 feet wide) was at one time authorized, but has since been deauthorized. However, private dredging occurs in the river.

Maintenance of fresh water flow and water quality during summer minimum flow periods is important for continuation and enhancement of fish runs. There is potentially a conflict between public water supply and the need to maintain minimum stream flows.

This subarea includes hundreds of acres of farmland and many residences which are dependent upon an extensive diking and drainage system for protection from flooding. The maintenance of this system is the responsibility of local diking districts which have limited funds. In some instances the only economically feasible material for dike maintenance are river bottom sediments outside the dike. An exception to Oregon Statewide Planning Goal 16 has been approved to allow subtidal dredging for dike maintenance.

Public access to the Lewis and Clark River is limited. Construction of a small boat ramp would significantly improve this situation. Concerns have been raised by local landowners about the potential negative impacts of increased public access. Problems cited by riparian owners include trespassing, damage to dikes, and erosion caused by boat wakes.

#### 4.18.6. Aquatic and Shoreland Designations

The river channel is designated Development from the Alternate Highway 101 bridge to the upstream end of the Cavenham log booming area. Adjacent to the Development Shoreland (Miles Crossing Subarea) south of the bridge and including the mouth of Jeffers Slough, the aquatic area from the shoreline out to the channel is designated Development.

Shorelands at the Cavenham log dump are designated Water-Dependent Development. The Fort Clatsop National Memorial and a small forested shoreland area are designated Conservation. Remaining shoreland is designated Rural.

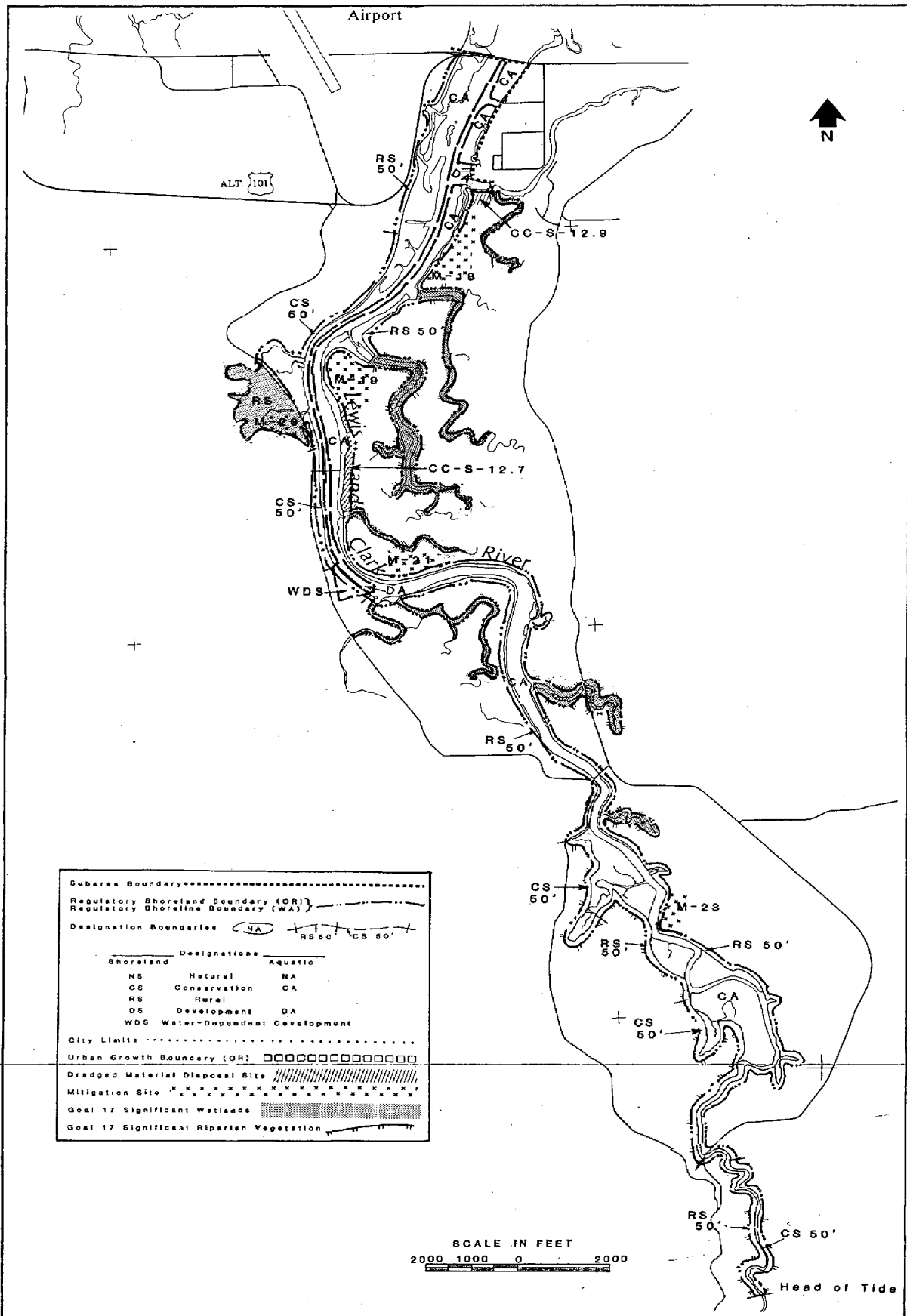
The regulatory shoreland boundary in this subarea is 50 feet from the shoreline, or from the inland toe of dikes and associated toe drains, whichever is greatest, except where it extends farther inland to include the following features:

1. Significant riparian vegetation along the following tidegated sloughs: Jeffers Slough, Barrett Slough, Green Slough, and other unnamed diked sloughs, as shown on Columbia River Estuary Resource maps; and significant riparian vegetation along the banks of the Lewis and Clark River to the head of tide as shown on Columbia River Estuary Resource Maps.
2. Jeffers Slough, Barrett Slough, Green Slough and other unnamed diked sloughs providing significant wetland habitat as shown on Columbia River Estuary Resource Maps.
3. A log-dump site designated Water-Dependent Development.
4. The following dredged material disposal sites listed in the 1986 Columbia River Estuary Dredged Material Management Plan: CC-S-12.9, CC-S-12.7.

5. Mitigation and restoration sites designated in the Columbia River Estuary Restoration and Mitigation Plan.

#### 4.18.7. Subarea Policies

1. Existing log storage areas should be inventoried to determine where logs rest on the bottom at low water. Use of these areas should be minimized and phased out as new sites adequate to meet industry needs are provided.
2. Boat ramps on the Lewis and Clark River shall be sited and designed to minimize negative impacts on adjacent properties. Only relatively small ramps offering access to smaller boats may be permitted.



Subarea Boundary		
Regulatory Shoreland Boundary (OR)		
Regulatory Shoreline Boundary (WA)		
Designation Boundaries (NA, RS 50', CS 50')		
Shoreland	Designations	Aquatic
NS	Natural	NA
CS	Conservation	CA
RS	Rural	
DS	Development	DA
WDS	Water-Dependent	Development
City Limits		
Urban Growth Boundary (OR)		
Dredged Material Disposal Site		
Mitigation Site		
Goal 17 Significant Wetlands		
Goal 17 Significant Riparian Vegetation		

SCALE IN FEET  
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Head of Tide



#### 4.19. MILES CROSSING

##### 4.19.1. General Description

This subarea extends between the intersection of Clover Lane with Jeffers Slough at the southwest, around the peninsula separating the Lewis and Clark River and the Youngs River, and Miller Slough toward the southeast. There are no estuarine aquatic areas in this subarea.

##### 4.19.2. Shoreland Features

The subarea's shorelands, except for the causeway fill for the Old Highway 101 bridge over the Youngs River, are diked. The area is entirely within the 100 year floodplain, with the exception of the highway and some lands north and west of the highway. The subarea consisted of tidal marsh and swamp before it was diked.

Soils are of the Coquille-Tidal Marsh (fresh) - Clatsop Association and topography is flat. Because the land is low, the agricultural suitability is fair to moderate, and there is no timber of commercial value. Much of the subarea is developed with residential, commercial and light industrial uses.

There are several tidegated sloughs in the subarea. The larger sloughs are classified as significant wetlands under Oregon Statewide Planning Goal 17. Wildlife values are high in the undeveloped areas and low in the developed areas.

##### 4.19.3. Human Use

The major agricultural use is grazing. Other land uses include rural and low density residential housing, commercial uses and light industry. The only water-dependent uses are the AMCCO Shipyard on the Lewis and Clark River, a small shipyard north of AMCCO, and boat construction at the mouth of Cook Slough. Commercial and industrial uses are concentrated along Alternate Highway 101. County roads provide access to nearby rural areas.

There is no sewer system, and septic tank suitability is poor. Sewering the area would probably require connection to the Warrenton or Astoria sewer systems.

Water and marsh areas adjacent to this subarea are used for hunting, fishing, boating and trapping. Some shoreline views are scenic.

#### 4.19.4. Issues

Major portions of this subarea were considered for inclusion in Astoria's Urban Growth Boundary in the late 1970s. The City and some commercial interests favored inclusion. A large majority of area residents who voiced their opinion were opposed. A decision was made not to include the area. Future inclusion may be possible (see subarea policy below).

The area has development potential due to its proximity to Astoria and the availability of flat land. This potential is constrained, however, by the lack of sewers, flood hazard, and poor soil suitability. Water-oriented development is feasible only along the Lewis and Clark River.

This subarea includes hundreds of acres of agricultural land and many residences which are dependent upon an extensive diking and drainage system for protection from flooding. The maintenance of this system is normally the responsibility of local diking districts which have limited funds. An exception to Oregon Statewide Planning Goal 16 has been approved to allow subtidal dredging for dike maintenance. The Corps of Engineers has completed a plan to rehabilitate the dikes in this subarea. As of the date of this Plan, no dike work has begun.

A boat construction facility adjacent to the tide box at the mouth of Cook Slough is presently being used for construction of steel-hulled fishing vessels. Extensive shoaling has substantially reduced water depths and launching is extremely difficult. The dredging of a "pothole" in the area would allow vessels to be launched in a safe manner and would permit the vessels to be moored at this location while final outfitting takes place. Movement out to the main river channel could occur at high tide. Continued shoaling of this area, however, could result in shallow water depths which would not allow the movement of these vessels (drafts of approximately 9 feet) out to the river channel even on the highest tides. Under those circumstances limited dredging for ingress and egress to the area would be appropriate. An exception to Oregon Statewide Planning Goal 16 will be required to permit this dredging.

#### 4.19.5. Shoreland Designations

All shorelands in this subarea are designated Rural, except for the existing industrial zone on the east bank of the Lewis and Clark River which is designated Water-Dependent Development, and the existing industrial zone between Alternate Highway 101 and Knowland Slough, which is designated Development.

The regulatory shoreland boundary in this subarea is 50 feet from the Youngs Bay shoreline, or from the landward toe of dikes and associated toe drains, whichever is greatest, except where it extends further inland to include the following shoreland features:

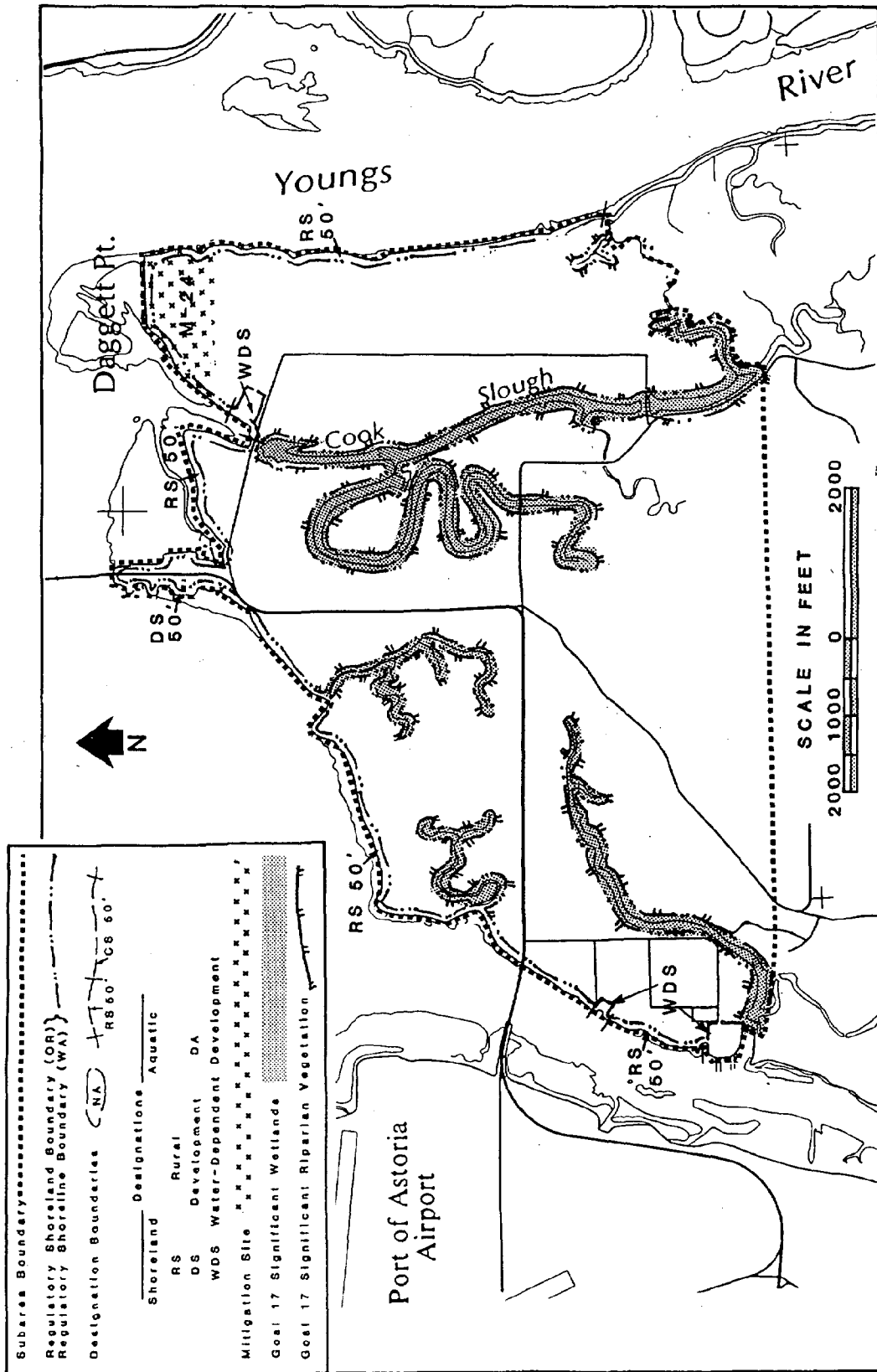
1. Significant riparian vegetation along Knowland Slough, Jeffers Slough, Cook Slough and other unnamed sloughs, as mapped on Columbia River

Estuary Resource Maps; and significant riparian vegetation along the Youngs Bay shoreline, as shown as Columbia River Estuary Resource Maps.

2. Jeffers Slough, Cook Slough, Knowland Slough, and other unnamed tidewater sloughs providing significant Goal 17 wetland habitat as shown on Columbia River Estuary Resource Maps.
3. The Astoria Marine Construction (AMCCO) boatworks, in a Water-Dependent Development Shorelands designation; a small boat shop about 1,500 feet downstream from the AMCCO facility, also in a Water-Dependent Development Shorelands designation; a partially developed site at the mouth of Cook Slough, also in a Water-Dependent Development Shorelands designation; and mitigation and restoration sites designated in the Mitigation and Restoration Plan for the Columbia River Estuary.

#### 4.19.6. Subarea Policies

1. The Rural designation in the Miles Crossing area recognizes that there are no plans to include this area in the Astoria Urban Growth Boundary (UGB) at this time. However, there are commitments between the County and City to reconsider the UGB issue during future review and update of plans. In the meantime, the nature and intensity of new uses should be consistent with the Rural designation and availability of public services.



4.19. Miles Crossing

## 4.20. YOUNGS RIVER

### 4.20.1. General Description

This subarea includes the aquatic and shoreland areas of Youngs River above the Old Highway 101 bridge upstream to the head of tide. On the west side of the river, the shoreland north of Millers Slough is not included. The boundary of this subarea in Astoria is the pierhead line between the bridge and the point where the Astoria city limits intersect the Youngs River shoreline. The subarea is under Clatsop County's jurisdiction.

### 4.20.2. Aquatic Features

The aquatic areas in this subarea include the Youngs, Walluski, and Klaskanine Rivers to the head of tide and adjacent tidal marshes and swamps. Diking has brought about large changes in this subarea in the past century. Broad tidal marshes and swamps flanked the shores of the rivers prior to being converted to agricultural land by diking and clearing. Most of the narrow fringing marshes along the rivers' shores formed after the dikes were built.

Youngs River has an average annual discharge of 560 cubic feet per second (cfs). Monthly average discharges can exceed 1,200 cfs in December and January, and typically range around 100 cfs in summer and fall. Two-thirds of the total annual river discharge occurs during the period of December through March. Flow reversals are evident as far upstream as Youngs RM 9.5 during average river discharge and RM 6 during high discharge.

The salinity levels in Youngs Bay and the discharge levels of Youngs River determine the salinity of the river. During the Columbia River freshet, both Youngs Bay and River are entirely freshwater. In fall, salt water intrudes into Youngs Bay and the mouth of Youngs River exhibits salinities of 4 to 10 ppt with significant salinity stratification. Brackish water moves up the river to RM 10. In winter, Youngs River becomes entirely freshwater.

The sediments of Youngs River grade from coarse-grained in upriver areas to fine-grained in downriver areas. The sediments consist of cobbles and boulders upriver from the Klaskanine River confluence. The river bed grades from sand to silt between the Klaskanine River confluence and Daggett Point. Fine suspended sediments tend to settle out in the portion of this stretch of river between the Walluski River confluence and Daggett Point. The sediments become coarser silt downriver from Daggett Point.

The plant types of the Youngs River Subarea include phytoplankton, benthic algae, and tidal marsh and swamp vegetation. Phytoplankton productivity levels in the lower river rank among the highest measured in the estuary. Benthic algal productivity on the lower river tidal flats is moderate to high. There is no information on phytoplankton or benthic algal productivity upriver from RM 5. Data on marsh production and community composition exist for the lower river only (to RM 8). The tidal low marshes

near the river mouth resemble the brackish marshes of Youngs Bay, while those farther upriver resemble the freshwater marshes of Cathlamet Bay (see Youngs Bay and Cathlamet Bay Subarea Plan). The dikes surrounding Haven Island breached in the early 1980's and the island is reverting to tidal marsh.

Invertebrate and fish utilization in the subarea is similar to Youngs Bay (see Youngs Bay Subarea Plan).

Several anadromous species are known to spawn in the river. American shad spawn in the upper portion of the Youngs and Walluski Rivers from June through August. Fall Chinook spawn in the Klaskanine River in August and September, coho in the Youngs and Klaskanine Rivers from August through October, and winter run steelhead in the Youngs and Klaskanine Rivers from November through March. In addition hatcheries on the Klaskanine River releases fall Chinook, coho, and steelhead.

Bird and wildlife use of the subarea is similar to Youngs Bay (see Youngs Bay Subarea Plan). A great blue heron nesting colony exists east of the subarea on Brown's Creek. Heron from this colony feed in Youngs River and Bay. Much of the subarea is within the home range of a nesting pair of bald eagles. The pair nests east of Youngs River near Cooperage Slough.

#### 4.20.3. Shoreland Features

Most shorelands in this reach are low diked lands in the 100 year floodplain. Soils are of the Coquille-Tidal Marsh (fresh) - Clatsop, Walluski-Knappa, and Nehalem Associations. These soils are fair to good for agricultural use. Most of the land is or has been in agricultural production. There is some commercially valuable timber and adjacent uplands are highly productive timberland. There is rural housing development along the main roads passing through the subarea.

Several tidegated sloughs drain the shoreland of the subarea. Most of the large sloughs are significant wetlands under Oregon Statewide Planning Goal 17.

Bird use of the shorelands is high and mammal use is high in the undeveloped areas and adjacent to the rivers and wetlands.

#### 4.20.4. Human Use

Major land uses are agriculture and rural housing. Highway access is provided by Oregon Highway 202 and county roads. Water is provided by three water districts; there is no sewer system, except at the old naval hospital. The scenic value of the river is high. There is a County park at Youngs River Falls and there are several undeveloped access points for angling.

The major human uses of the aquatic areas are fishing, log storage and transport, and recreational boating. There is one active diking district and one defunct diking district on the Youngs and Klaskanine Rivers. Most dikes

throughout the area have been maintained by barge-mounted dragline. An exception to Oregon Statewide Planning Goal 16 has been approved to allow subtidal dredging for dike maintenance. The Corps of Engineers has completed a plan to rehabilitate the dike from the Miles Crossing subarea to Binder Slough. As of the date of this plan, work has not begun.

The cumulative impact of diking in this subarea has been substantial. Nearly all of the former marshes and swampland along the rivers have been converted to agricultural use. Remaining intertidal areas are greatly diminished relative to their pre-diking size.

#### 4.20.5. Issues

There is limited development potential in this subarea because of the flood hazard, poor transportation network and distance from developed areas. Residential development may occur on adjacent upland areas. The old naval hospital site is on high ground near the intersection of Youngs and Walluski Rivers, has water and sewer systems, and could be developed. Increased residential use in the Youngs River area is likely. Water-related issues include the preservation of diked, freshwater wetlands, log storage in wetland areas where logs may go aground at low water, and the dredging of shallow productive areas for fill material to maintain dikes.

This subarea includes hundreds of acres of farmland and many residences which are dependent upon an extensive diking and drainage system for protection from flooding. The maintenance of this system is the responsibility of local diking districts which have limited funds. In some instances the only economically feasible material for dike maintenance are river bottom sediments outside the dike.

The Youngs River subarea contains significant natural values which should be protected. Except for extensive diking, people have changed this environment to a lesser extent than many other portions of the estuary. There is a substantial local and state investment in fisheries enhancement. The state and Clatsop Economic Development Committee operate fish hatcheries on the Klaskanine River. Expansion of these fish-rearing efforts is planned. The construction of a fish ladder at Youngs River Falls and the use of the area for mitigation sites could result in development of the river as an extremely valuable fisheries resource. Youngs River Falls has also been considered as a potential hydroelectricity development site.

#### 4.20.6. Aquatic and Shoreland Designations

The authorized navigation channel in Youngs River is designated Development to Haven Island. The following aquatic areas are designated Natural: Cooperage Slough, Grant Island, Haven Island, Fry Island, and the tidal flats downstream of the Walluski River on both sides of the river including Daggett Point. Remaining aquatic areas are designated Conservation.

Shorelands in this subarea used for agriculture and associated uses are designated Rural. Areas along the upper tidal reaches of the Walluski, Klaskanine, and Youngs River, and shorelands used primarily for timber production are designated Conservation.

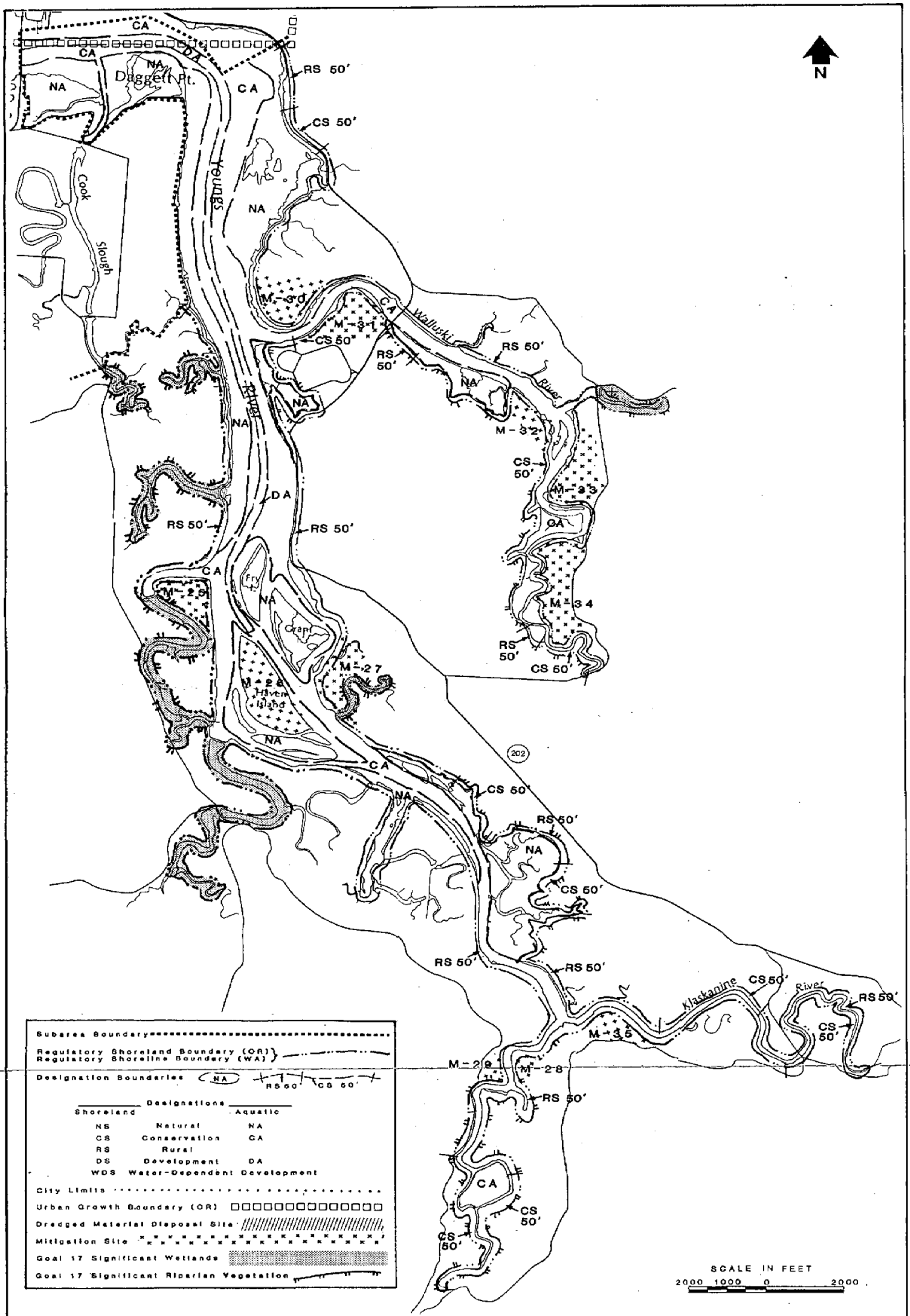
The regulatory shoreland boundary in this subarea is 50 feet from the Youngs River shoreline, or from the landward toe of dikes and associated toe drains, whichever is greater, except where it extends farther inland to include the following shoreland features:

1. Significant riparian vegetation along both banks of the Youngs River, the Walluski River, the Little Walluski River, Crosel Creek and the Klaskanine River to the head of tide, as mapped on Columbia River Estuary Resource Maps; and significant riparian vegetation along diked sloughs as shown on Columbia River Estuary Resource Maps, including Sales Slough, Binder Slough, Casey Slough, Tucker Creek Slough, Battle Creek Slough and other unnamed sloughs.
2. An eagle's nest near Cooperage Slough and a 50-foot buffer around the next tree.
3. Sales Slough, Binder Slough, Tucker Creek Slough, Battle Creek Slough, Casey Slough and other unnamed sloughs providing significant Goal 17 wetland habitat as shown on Columbia River Estuary Resource Maps.
4. Mitigation and restoration sites as designated in the Mitigation and Restoration Plan for the Columbia River Estuary.

#### 4.20.7. Subarea Policies

1. Existing log storage areas should be inventoried to determine where logs rest on the bottom at low water. Use of these areas should be minimized and phased-out as new sites adequate to meet industry needs are provided.
2. To protect present investments and the future potential of the fisheries resource of the Youngs River, new development in the area shall be carried out so as to preserve water quality, biological productivity, and other factors which contribute to fisheries production.





Subarea Boundary		-----
Regulatory Shoreland Boundary (OR)		-----
Regulatory Shoreline Boundary (WA)		-----
Designation Boundaries		-----
Shoreland Designations		Aquatic
NS	Natural	NA
CS	Conservation	CA
RS	Rural	
DS	Development	DA
WDS	Water-Dependent Development	
City Limits		.....
Urban Growth Boundary (OR)		□□□□□□□□□□
Dredged Material Disposal Site		
Mitigation Site		
Goal 17 Significant Wetlands		
Goal 17 Significant Riparian Vegetation		

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## 4.21. SOUTH ASTORIA

### 4.21.1. General Description

This subarea covers the north shore of Youngs Bay between the new Youngs Bay bridge and the junction of the Astoria city limits with the shoreline. West of the old Youngs Bay bridge only the shorelands are a part of the subarea. East of the old Youngs Bay bridge the shorelands and the aquatic area out to the pierhead line are included.

Most of the subarea is within the city limits and the Urban Growth Boundary of the City of Astoria. Some aquatic areas in the eastern portion of the subarea are outside of the UGB under Clatsop County's jurisdiction.

### 4.21.2. Aquatic Features

The aquatic portion of this subarea includes the nearshore waters along the south Astoria waterfront. Much of the shoreline is riprapped and there are fringing marshes and tide flats along the shore. Aquatic physical and biological features are discussed in the Youngs Bay Subarea Plan.

### 4.21.3. Shoreland Features

The shorelands of this subarea are a narrow band of developed land between the water and Marine Drive/Highway 202. Soils are fill material and Coquille-Tidal Marsh (fresh) - Clatsop Association. Wildlife values are minimal, because most of the surface is paved and the shoreline is riprapped.

### 4.21.4. Human Use

Residential, commercial and industrial uses are found on these shorelands. Water-oriented uses include the Astoria Yacht Club adjacent to the old Youngs Bay bridge north footing, a shipyard, a launching, mooring, boat maintenance and fueling facility at Tidepoint, and other small docks and moorages. The Clatsop Economic Development Committee maintains salmon rearing pens west of Tidepoint. The salmon are raised to smolt size and released into the Youngs River. The former Bumblebee shipyard (now Corderman, Oregon) has had limited activity.

#### 4.21.5. Issues

Most suitable development sites in this subarea have already been developed. Industrial sites include the former Bumblebee Shipyard, the abandoned PP&L plant and the Fluhrer Brothers shingle mill. Some dredging would be needed adjacent to the PP&L site to provide access to the Youngs Bay Channel. Dredging at this site could probably not be approved because of coal tar contamination in the sediments and the fear that polyaromatic hydrocarbons (PAHs) and benzene would be released into Youngs Bay (see Youngs Bay Subarea Plan). Dredging would probably also be necessary to provide water access to the old Bumblebee Shipyard facility. Though there is deep water close to shore between the old Youngs Bay bridge and the Tidepoint Dock, little backup land is available. Extensive fills in the Youngs River/Youngs Bay system would conflict with the high natural values of the area. Concerns have been expressed about interference with upland views as a result of development along the bay.

#### 4.21.6. Aquatic and Shoreland Designations

The aquatic area east of the old Youngs Bay bridge out to the pierhead line is designated Development between the bridge and 11th street, and Conservation east of 11th Street to the subarea boundary.

Shorelands in this subarea are designated Development with the exception of the area bounded by the old Youngs Bay Bridge, Highway 202, and 11th Street, which is designated Water-Dependent Development.

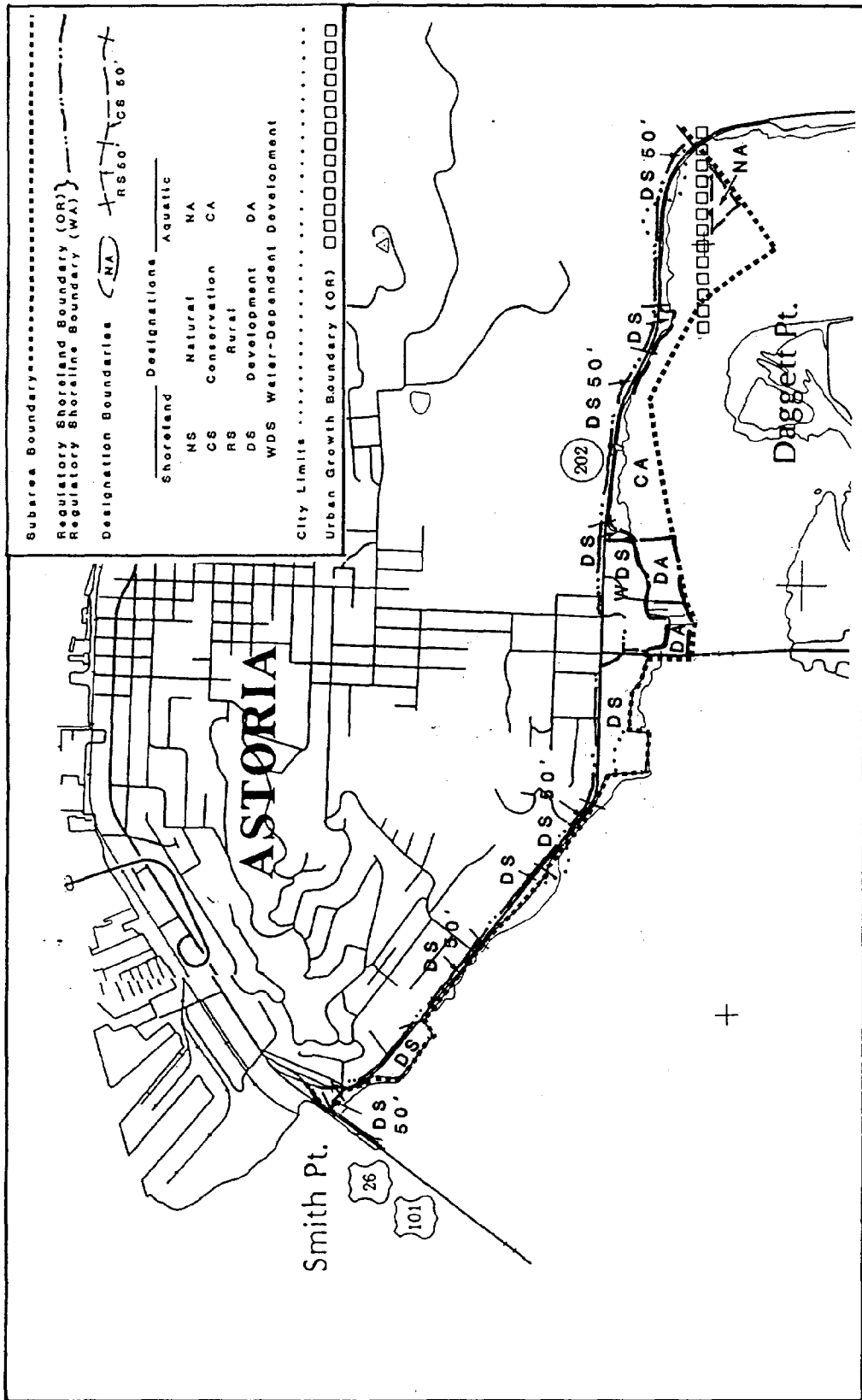
The regulatory shoreland boundary is 50 feet from the Youngs Bay and Youngs River shoreline in this subarea, except where it extends farther inland to include the following shoreland features:

1. Shoreland bounded by the Old Youngs Bay Bridge, Highway 202, and 11th Street necessary for water-dependent uses.
2. All other shorelands between the new Youngs Bay Bridge (U.S. Highway 101) and the eastern Astoria City limits, waterward of Highway 202, with the exception of the PP&L substation at the southeast corner of 11th Street and Highway 202.

#### 4.21.7. Subarea Policies

1. Development of the shoreland occupied by the old Pacific Power and Light facility shall be evaluated for its impacts related to contaminated sediments buried on site. Potential exposure of coal tar pollutants from disturbance of contaminated sediments shall be avoided.

2. Potential conflicts between new development and existing uses on the South Astoria Waterfront will be evaluated on a case-by-case basis during permit review.
3. Proposed developments shall be evaluated for their impact on existing aquaculture operations. Aquatic sites that are especially suitable for aquaculture development shall be reserved for that use whenever possible.



4.21. South Astoria

## 4.22. PORT OF ASTORIA

### 4.22.1. General Description

This subarea includes shorelands and aquatic areas along the Astoria waterfront between the Astoria-Megler Bridge and the Youngs Bay Bridge causeway. The Port of Astoria piers, the federally-authorized turning basin, the West End Mooring Basin, the Red Lion Inn complex and the Union Cannery are included.

### 4.22.2. Aquatic Features

The aquatic portions of this subarea include shallow flats west of Pier 3, deep water off the Port piers, and waters between the piers and east of Pier 1. Aquatic features on the shallow flats west of Pier 3 are similar to those in Youngs Bay (see Youngs Bay Subarea Plan). Benthic infauna densities are very high on these flats. The aquatic characteristics of the waters off of the Port piers are similar to those in the adjacent channel (see Estuary Channels Subarea Plan).

Much of the aquatic habitat between the finger piers, within the mooring basin, and east of the basin, is somewhat degraded because of Port and mooring basin use and past cannery use. Sediments in these areas consist primarily of very fine sand, silt, and clay. Benthic infauna have been sampled on the tidal flat east of the mooring basin. Infauna densities in that area are moderate.

### 4.22.3. Shoreland Features

The shorelands of the subarea are flat and consist largely of fill material obtained from the Columbia River. The subarea is almost entirely developed for port facilities. The only shoreland vegetation consists of upland grasses, scotch broom, and other shrubs located on and adjacent to Pier 3. The subarea has little wildlife value.

### 4.22.4. Human Use

The Port of Astoria, the West End Mooring Basin, and the Red Lion Inn are the major facilities in this subarea. The Port of Astoria facilities contain 3 piers, a port office building, warehouses, open dock and storage areas, a barge slip, and a marina for small commercial and recreational vessels. There are also several warehouses and a tank farm located on Port-owned property. The railroad and Highway 101 are adjacent to this subarea.

Pier 3 was used for assembly of oil well modules for use in outer-continental shelf and nearshore waters in Alaska. The project demonstrated the feasibility of assembling these modules in the estuary. Declining petroleum prices resulted in the closure of the Pier 3 facility in 1986.

#### 4.22.5. Issues

Additional Port lands might be obtained by filling one or both of the pier slips or by filling west of Pier 3 or east of Pier 1. Extensive filling has been strongly opposed by resource agencies. A permit for an 80-acre fill west of Pier 3 was denied in 1976. Future Port of Astoria development plans involve extending the face of Pier 1 to the east to accommodate larger cargo vessels. Additional plans include bulkheading and other structural repairs to the piers, and construction of new warehouse, office, and restaurant buildings (Port of Astoria Marine Terminals Development Plan, 1985).

Cargoes at the Port of Astoria have consisted almost entirely of logs in recent years. The Port has carried out a major rehabilitation of Pier 1 with the establishment of a new berth presently used for the shoreside handling of logs.

A Mediation Panel Agreement between state and local governments and resource agencies on potential development of several sites along the Lower Columbia River in Oregon was reached in 1981. This agreement designated aquatic and shoreland areas for development as well as resource protection. The agreement's policies and designations for the Port of Astoria are included in the applicable sections of this subarea plan.

It is important to note that the 1985 Port of Astoria development plan does not include future filling between the finger piers, although the Mediation Panel Agreement did address it. Instead, port plans now call for expansion of the dock face at Pier 1 to the east. This would involve fill of approximately 4 acres to the west of the existing mooring basin in the first stage, fill of approximately 10 acres east of the mooring basin in the second stage, and fill of the area in between now occupied by the West End Mooring Basin in the final stage. This potential fill area was not included in the Mediation Panel Agreement.

The tidal flats west of Pier 3 are a valuable natural resource. Benthic animals are abundant and the area used by salmon migrating downstream and by other fishes. This is discussed in the Youngs Bay Subarea Plan. These tidal flats are also an attractive development site, being adjacent to both the main ship channel and existing Port facilities.

#### 4.22.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The aquatic area between the eastern tip of the port piers and a point 220 feet west of the end of Pier 3 and lying South of the pierhead line.

This area includes 19.4 acres within the finger piers and 2.1 acres of aquatic area lying 220 feet West of the East tip of Pier 3 and South of the pierhead line (Mediation Panel Agreement).

2. A 10-acre subtidal area West of the 2.1 acre area described above (Mediation Panel Agreement), to be developed using piling to the maximum extent feasible.
3. The aquatic area between the east side of Pier 1 and the Columbia River bridge, south of the pierhead line, including the mooring basin and the Union Cannery.
4. The turning basin, and the area between the piers and the turning basin.

The following aquatic areas are designated Conservation:

1. The aquatic area between 3 feet below MLLW and the Navigation channel, excluding the aquatic area designated Development by the Mediation Panel Agreement, and excluding the designated turning basin.

The following aquatic areas are designated Natural:

1. The remainder of the aquatic area west of Pier 3.

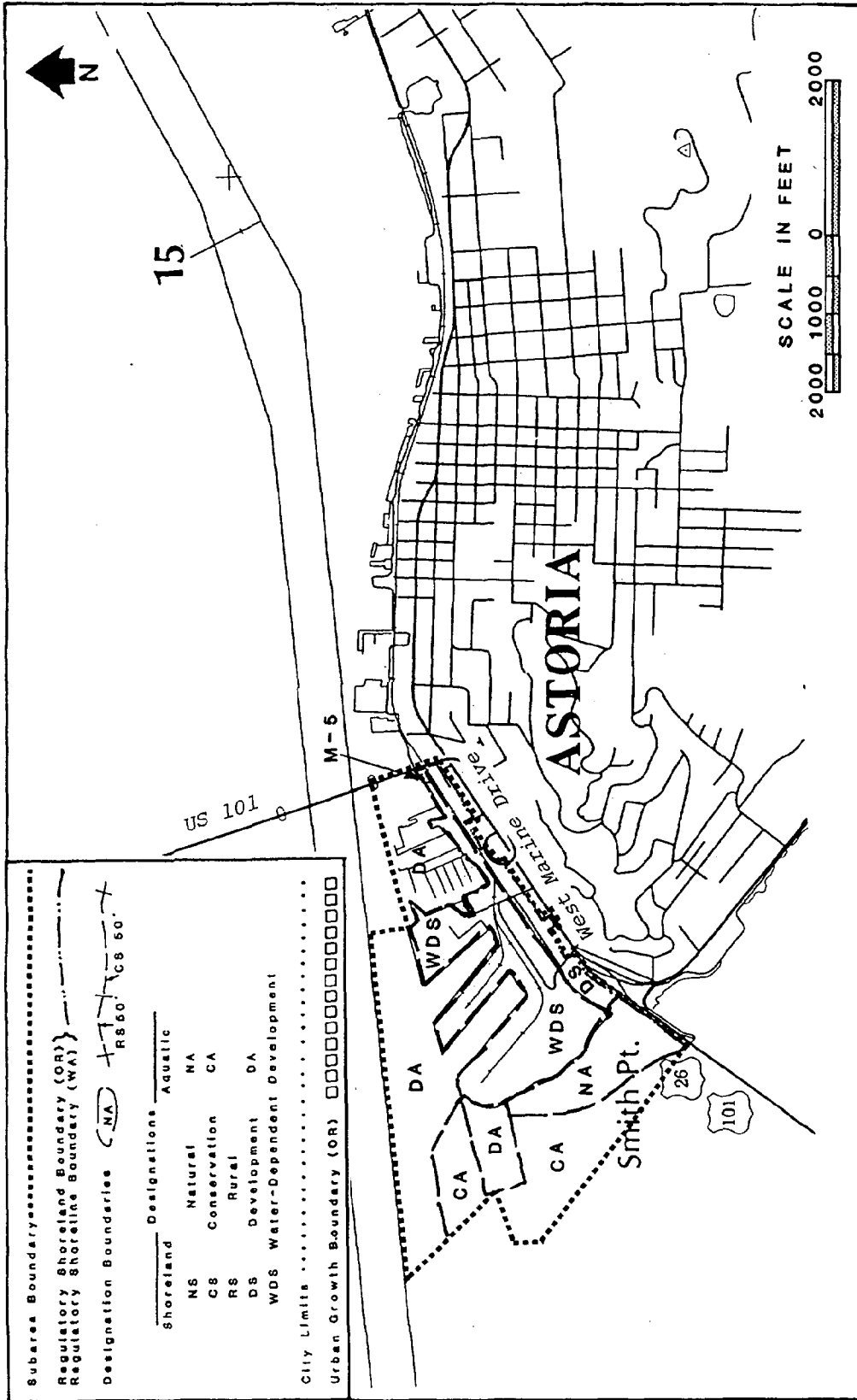
All shorelands are designated Water-Dependent Development, except those south of the railroad right-of-way in a Development designation.

The regulatory shoreland boundary in this subarea includes areas designated Water-Dependent Development shorelands and areas designation Development shorelands.

#### 4.22.7. Subarea Policies

1. Filling of slips 1 and 2 and the 2.1 acre site north of Pier 3 may occur as required to meet specific development proposals.
2. The 10-acre aquatic development parcel west of Pier 3 may be developed as part of a specific proposal to fully utilize the filled area inclusive of slip 2, the 2.1 acre fill, Pier 3, and the existing filled area adjacent to Pier 3.
3. The 10-acre aquatic development area shall be developed using piling to the maximum extent feasible.
4. Filling shall only be allowed for water-dependent uses. Specific proposals for the extent of fill or pile in the area west of Pier 3 must be justified at the time of permit application, specifically addressing physical and biological effects on the area west of Pier 3.





4.22. Port of Astoria

## 4.23. DOWNTOWN ASTORIA WATERFRONT

### 4.23.1. General Description

This subarea includes shorelands and aquatic areas within the City of Astoria between the Astoria-Megler Bridge and 29th Street. The waterward boundary is the 20-foot bathymetric contour, or the pierhead line, whichever is farther waterward. The upland boundary is Marine Drive.

### 4.23.2. Aquatic Features

With the exception of nearshore areas, the aquatic physical and biological characteristics in this subarea are similar to those in the adjacent channel (see Estuary Channels Subarea Plan). Near the shoreline sediments become finer and benthic infauna densities higher than in the adjacent channel. Subyearling fall Chinook salmon migrate along the shallow nearshore areas.

### 4.23.3. Shoreland Features

Virtually all of the shorelands in this subarea are former aquatic areas filled with sandy dredged material. There is little vegetation and no wildlife habitat. The shorelands are not in the floodplain.

### 4.23.4. Human Use

This is an industrial and commercial area with few residences. Many uses are water-dependent or water-related, including fish unloading and processing, boat and tug moorage, bar and river pilot offices, the Astoria Plywood Mill, petroleum off-loading, marine equipment suppliers, and the Columbia River Maritime Museum. The Pier 11 complex of shops and a restaurant is focused on the water.

The Elmore Cannery and the Bonded Warehouse are both listed on the National Register of Historic Places. These sites are protected through provisions of the City of Astoria's Zoning Ordinance.

Rail, road and water access are available. All utilities are provided by the City of Astoria. Several street ends are popular public water access points. The view of the Columbia River and the waterfront from the higher areas of Astoria is scenic.

#### 4.23.5. Issues

The development potential of this area for maritime commerce is limited, despite the adjacent shipping channel and deep water, because there is little undeveloped backup land. An increasing number of stores, offices and light industrial concerns that are not water-oriented have located in this subarea in recent years. Although there are some waterfront areas which presently contain strictly water-dependent uses, there is a general desire by the City to permit a mixture of uses. Tourist facilities, redevelopment of old canneries and fish processing facilities are the most likely new water-oriented uses. Other large-scale water-dependent and industrial uses may conflict with tourist-oriented businesses because of public safety, security, road and rail traffic, and aesthetic concerns.

Public access to the waterfront is presently available via numerous publicly-owned street ends and some vacant waterfront lands. Development of publicly-owned sites to provide good public access to the waterfront is a high priority and will require a considerable investment.

The Astoria Waterfront Revitalization Plan calls for mixed-use tourist-oriented development and increased public access. A public pier may also be developed adjacent to Pier 11 and public walkways may be built along the waterfront.

#### 4.23.6. Aquatic Designations

The aquatic area is designated Development out to the pierhead line. The main navigation channel and a flowlane disposal strip on each side (either 600 feet wide or extending up to the 20-foot bathymetric contour, whichever is narrowest) is designated Development. The area between the pierhead line and the flowlane is in a Conservation designation.

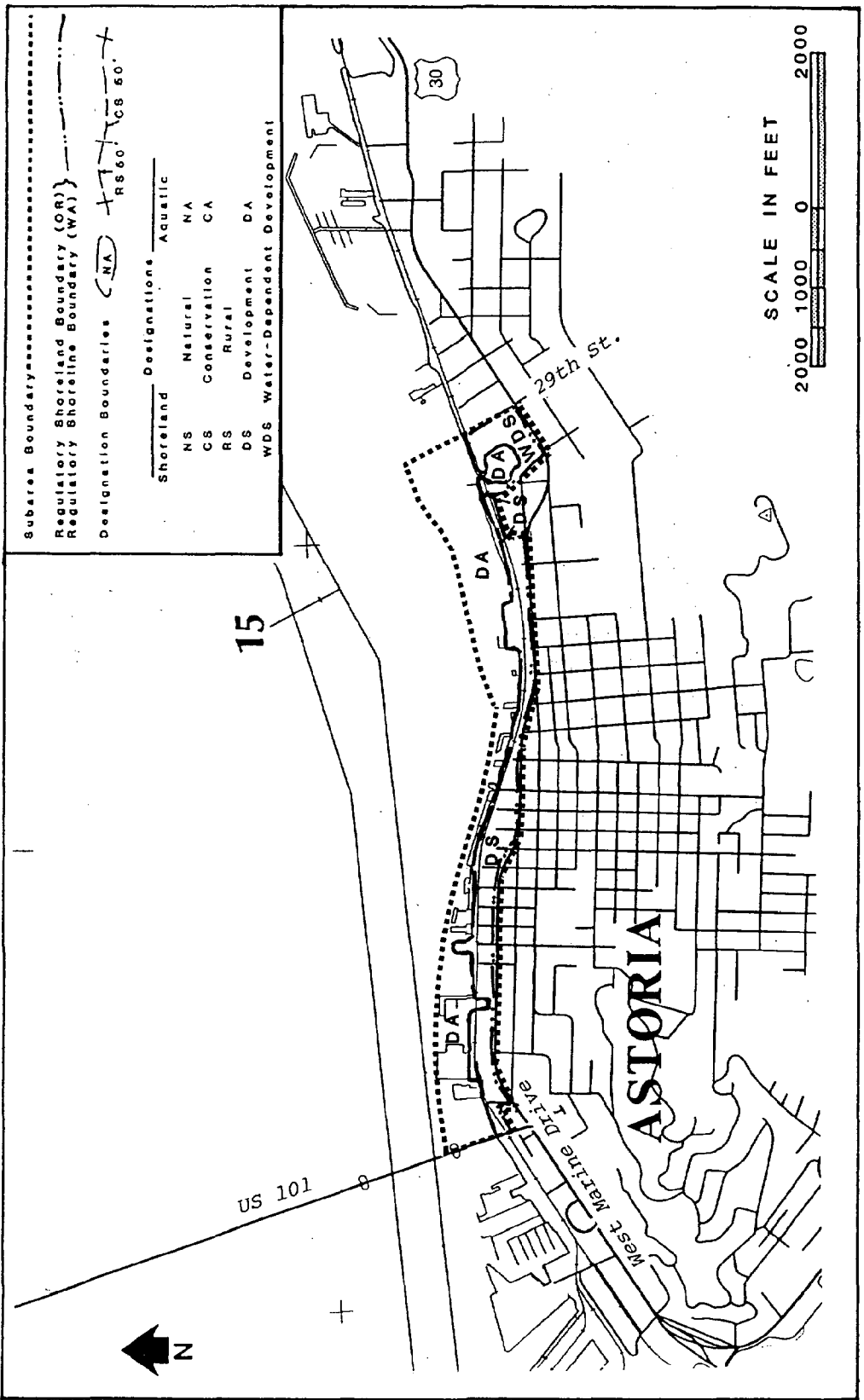
The shoreland designations from west to east are: from the Astoria-Megler Bridge to the western boundary of the Astoria Plywood Corporation is Development (the eastern boundary of this Development area extends from the shoreline at 22nd Street north to Commercial Street, thence east 1/2 block, thence north between the Plywood Corp. offices and the McCracken Motor Freight facilities to Marine Drive); and from the above described boundary east to the subarea boundary is designated Water-Dependent Development (including the Astoria Plywood Mill).

The regulatory shoreland boundary in this subarea is 50 feet from the Columbia River shoreline, except where it extends further inland to include the following shoreland features:

All shorelands are in Development and Water-Dependent Development designations.

#### 4.23.7. Subarea Policies

1. Public access to this area of the Astoria waterfront is strongly encouraged at street ends, at areas designated in the Astoria Waterfront Revitalization Plan.
2. The historic character of the Elmore Cannery and the Bonded Warehouse will be protected through application of the Historic District element of the City of Astoria's Zoning Ordinance.
3. A walking/jogging path along the waterfront is needed. Use of the Burlington Northern railroad right-of-way should be explored.



4.23. Downtown Astoria Waterfront

#### 4.24. UPPERTOWN/ALDERBROOK

##### 4.24.1. General Description

This subarea contains shorelands and aquatic areas in eastern Astoria. The waterward boundary is the 20-foot bathymetric contour. The western boundary is 29th Street. The upland boundary extends eastward from 29th Street on Marine Drive/Leif Erickson Drive to 44th Street, north to the 100 year floodplain boundary, east to 53rd Street, north to Alder Street, then east along Alder Street and continuing straight east to the city limits. The eastern boundary follows the city limits.

##### 4.24.2. Aquatic Features

The aquatic portions of this subarea include open water and nearshore habitats in the river and Alderbrook Cove. The aquatic characteristics of the open water areas are similar to the adjacent channel (see Estuary Channels Subarea Plan). In the nearshore habitats, sediments become finer and benthic infauna productivity higher. A 1980 study reported high densities of amphipods in nearshore areas of the subarea. Juvenile fall Chinook salmon migrate in the shallow nearshore habitats. Alderbrook Cove contains fine sediments and probably has high benthic productivity. The Cove is partially fringed by low elevation tidal marshes. Bird use on the marshes and adjacent tidal flats is high.

##### 4.24.3. Shoreland Features

The shorelands in this subarea include the waterfront from 29th Street east and the Astoria sewer lagoons. The shorelands are developed except for sandy dredged material disposal sites both east and west of Alderbrook Cove. The area east of the Cove is vegetated with primarily scotch broom on the uplands and with emergent wetland plants and shrubs in a wetland area on the southeast corner of the site.

Wildlife values are minimal in the developed areas and moderate in the undeveloped areas. The sewer lagoons receive high bird use.

##### 4.24.4. Human Use

Considerable construction occurred in this subarea between the plywood mill and the East End Mooring Basin in the 1970's. The new buildings include city shops, light industries, and a grocery store. Water-dependent and water-related uses include fish receiving and processing facilities, net racks and the East End Mooring Basin. No new water-dependent or water-

related facilities have been constructed in the last decade. There is a trailer court adjacent to the East End Mooring Basin. The East End Mooring Basin and its small area of backup land remain largely undeveloped. Surge prevents use of the East End Mooring Basin by all but the largest vessels, and even they are not secure during storms.

This subarea has city water, sewer, and road access to Highway 30. The railroad runs along the shoreline.

Alderbrook is the only residential area of Astoria that has immediate frontage on the water. It contains a number of nineteenth century houses and has a quiet attractiveness not found elsewhere along the waterfront.

#### 4.24.5. Issues

Shorelands in this subarea do not have direct access to deep water. The ship channel is 2,000 to 4,000 feet from the shoreline, though several ship anchorages are south of the channel. Shallow draft boat access is available throughout the area but low tides uncover substantial flats. Rock piles from old ship ballast and rock ledges further limit access. Most boat traffic is concentrated around the East End Mooring Basin, which is presently under-utilized.

The Corps of Engineers has investigated possible improvements to the East End Mooring Basin breakwaters that would correct the surge problem now experienced. Eliminating the surge would open the basin to a large number of vessels and increase the need for dredging and for back-up land to support basin operations. Vacant shorelands should be reserved for support uses.

Most of the subarea shorelands are already developed and there are no large vacant parcels. Between 35th and 41st Streets, however, is mostly vacant land with the potential to support water-dependent and water-related uses associated with the boat basin.

The Water-Dependent Development site immediately west of Alderbrook Cove may be reconfigured to include land closer to the Mooring Basin, and exclude land immediately adjacent to the Lagoon. An exception to Oregon Statewide Planning Goal 17 may be necessary.

The 1986 Lower Columbia River Assessment of Oregon Deep Draft Sites identified Alderbrook Cove, the small park east of the cove, the existing water-dependent development site west of the cove and adjacent aquatic area extending approximately 1500 feet into the Columbia River as a potential port development site. Development would involve filling the cove and adjacent Columbia River area. The fill would cover approximately 170 acres.

There is a conflict over designation of this port development site in the Plan. Local residents and the City of Astoria have stated that development of the site as projected in the Deep Draft Sites assessment would generate unacceptable negative impacts on the Alderbrook neighborhood. In addition, the aquatic area of the site is designated Conservation. Adequate mitigation sites have not been identified for this development. Redesigna-

tion of the area to Development would require an except to Oregon Statewide Planning Goal 16. The Oregon State Department of Economic Development and Division of State Lands have stated that a port development site in addition to those already designated is needed in the Astoria area. The Deep Draft Sites Assessment states that Astoria is Oregon's only alternative to Portland for a deep-draft port potentially served by barge and competitive rail.

Port development near the Alderbrook area is not consistent with maintenance of the aquatic area habitat, scenic, and recreational values. It is also inconsistent with the Alderbrook neighborhood residential area. In addition, designation of a deep-draft port site at the proposed location requires full involvement of public agencies and citizens. This coordination has not yet occurred. For these reasons, this Plan has retained the Aquatic Conservation designation of Alderbrook Cove and adjacent Columbia River area and has not designated a new port site.

#### 4.24.6. Aquatic and Shoreland Designations

The aquatic area between 29th and 41st Streets is designated Development to the pierhead line, except at the East End Mooring Basin where the designation corresponds to the outer boundary of the pier. East of 41st Street, the aquatic area is designated Conservation.

Shorelands are designated Development, except for the Water-Dependent Development site west of Alderbrook Cove between 35th and 41st Streets.

The regulatory shoreland boundary in this subarea is 50 feet from the Columbia River shoreline except where it extends further inland to include the following shoreland resources:

1. Lands surrounding the Astoria sewage lagoons, in a Development Shoreland designation;
2. Lands adjacent to Alderbrook Cove, in a Development Shorelands designation;
3. Lands adjacent to and east of the Astoria East End Mooring Basin, in a Development Shoreland designation;
4. Lands between 29th and 35th Streets, north of Leif Erickson Drive/Marine Drive, in a Development Shorelands designation;
5. Dredged material disposal site A-S-16.3 (from the Columbia River Estuary Dredged Material Management Plan);
6. A mitigation site on the east side of Alderbrook Cove (from the Columbia River Estuary Restoration and Mitigation Plan).



## 4.25. TONGUE POINT

### 4.25.1. General Description

This subarea covers both shorelands and aquatic areas between the navigation channel on the north, the MARAD Basin on the east, the Astoria Urban Growth Boundary on the south, Highway 30 on the west (from the Astoria Urban Growth boundary on the south to Mill Creek), and the Burlington Northern Railroad right-of-way (from Mill Creek to the Astoria sewage ponds). This subarea contains the former Tongue Point Naval Station and finger piers, portions of the federal Job Corps Center, and the U. S. Army Corps of Engineers Field Station. The area is in the Astoria Urban Growth Boundary, under the jurisdiction of Clatsop County.

### 4.25.2. Aquatic Features

The aquatic areas include the access channel to Tongue Point from the Columbia River, the area surrounding 8 large finger piers, the MARAD Basin between Mott Island, Lois Island and South Tongue Point, the tidal flats and marshes adjacent to the Corps of Engineers Field Office, and water areas west and north of Tongue Point and the Coast Guard piers.

The aquatic area adjacent to Tongue Point has been highly altered by human activities. Prior to 1939, the area between the mouth of the John Day River and Tongue Point was an area of shallow waters, tidal flats, and marshes. The railroad track marked the approximate shoreline east of the neck of Tongue Point, except on the west side of the John Day River mouth, where the railroad track cut off a shallow embayment. The present Mott and Lois Islands were tidelands or waters up to 15 feet deep. The material dredged from the entrance channel into Tongue Point and the MARAD Basin was used to form virtually all of the low-lying, flat lands of the present Tongue Point and Corps of Engineers facilities. Mott and Lois Islands in the adjacent subarea were also formed with this material.

The aquatic area north and west of Tongue Point differs markedly from the basin formed by the Point and Lois and Mott Islands. The aquatic characteristics north and west of Tongue Point are discussed in the Estuary Channels Subarea Plan.

The partially enclosed aquatic area east of Tongue Point is characterized by slower currents, finer sediments, and lower salinity than the main channel. The entrance channel into Tongue Point ranges from about 40 feet deep at the mouth to about 25 feet deep east of the finger piers. The MARAD Basin is generally between 20 and 26 feet deep. Depths between the finger piers are generally less than 15 feet. A band of intertidal areas, including tidal flats, marshes, and swamps, surrounds the south Tongue Point peninsula. This intertidal area varies from 300 to 1,500 feet in width and averages about 500 feet in width. Currents and flushing in these waters east of Tongue Point result

primarily from tidal flow. Columbia River flow through the south channel is relatively small and the discharge of the John Day River is inconsequential.

Sediments in the area east of Tongue Point consist primarily of very fine sand, silt, and clay. Organic content is fairly high in some areas, and the layer of navy grey paint in the MARAD Basin may cause the sediments to be polluted according to EPA standards. Based on bathymetric surveys and core studies, the average sedimentation rate in the MARAD Basin is 4-6 cm/yr (about 2 in/yr) at the present depth of 20-26 feet below MLLW.

Tidal marshes and swamps in the subarea exist primarily around the south Tongue Point peninsula. The tidal swamps form an approximately 250-foot wide band around the peninsula. They contain primarily shrub species. The tidal marshes form a fringe waterward of the swamps. This fringe extends 1,200 feet on the north side of the peninsula. Softstem bulrush (Scirpus validus) dominates the lowest elevation marshes while Lyngby's sedge (Carex lyngbyei), reed canary grass (Phalaris arundinacea) and cattail (Typha angustifolia) dominate the higher elevation marshes.

Of the estuary's invertebrates types, only benthic infauna have been sampled in the area east of Tongue Point. Important fish prey items such as amphipods (Corophium salmonis), insect larvae (chironomids), and freshwater clams (Corbicula manilensis) dominate the infauna community. Infauna biomass is high compared with sandy areas of the estuary.

Fishes found to be abundant in the subarea include species tolerant of freshwater conditions and anadromous species. Two marine demersal species tolerant of freshwater, starry flounder and Pacific staghorn sculpin, utilize the subarea. Subyearling starry flounder are particularly abundant in summer. Another marine species, whitebait smelt, has been found in the subarea in winter. The most abundant freshwater species in the subarea are threespine stickleback and peamouth. White sturgeon are also abundant.

Two species that spawn in the estuary, longfin smelt and shiner perch, utilize the subarea. Longfin smelt, an anadromous species, spawns from November through March. Smelt ranging in age from yearlings through adults are found in the subarea in winter. Larval longfin smelt appear in the estuary in winter and spring and subyearlings utilize the subarea as a nursery area in fall. The subarea is probably important to shiner perch only as a nursery area because only subyearling perch are abundant. They use the subarea primarily in summer.

In addition to longfin smelt, several other anadromous species, including American shad and the salmonids, use the subarea as a migration route and nursery area. Adult American shad migrate upriver in June and July. Most of the upstream migrants are destined for spawning areas upriver from the estuary and do not pass through the subarea. Some, however, migrate through the subarea and spawn in the John Day River. Juvenile American shad migrate downriver primarily in November

and December. Juvenile shad, originating from upstream spawning areas as well as from the John Day River, use the subarea as nursery area. The subarea is a nursery area for juvenile salmon. Subyearling Chinook salmon are abundant during their spring and summer migrations and remain fairly abundant through fall and winter. Yearling coho are found in greater abundance in the subarea than in other estuarine areas during their spring migration. Yearling Chinook and juvenile steelhead and cutthroat trout migrate through the subarea primarily in spring.

The subarea provides habitat for several species of resident and migratory birds. Double-crested cormorant are found in the subarea in winter while pelagic cormorant are found in spring, fall, and winter. Common merganser, a resident waterfowl species, utilize the subarea in fall and winter. Western grebe, a migratory species, winters in the subarea. The tidal flats and low marshes provide feeding areas for great blue heron year round and for shorebirds primarily in spring.

Bald eagle use of the Tongue Point area was studied intensively in 1984 and 1985. The subarea is used by a resident pair of eagles, referred to as the Mill Creek pair, and by transitory and wintering eagles. The Mill Creek pair's nesting site is located about 2,500 feet east of the subarea along Mill Creek. The nesting area is protected under Astoria's Comprehensive Plan and by state and federal regulations. Another eagle pair nesting several miles to the east use the extreme eastern part of the Tongue Point Subarea. This pair is discussed in the John Day-Eddy Point Subarea Plan.

The home range or territory of the Mill Creek pair encompasses the entire Tongue Point subarea and portions of the adjacent subareas. The eagles' use of the subarea includes use of old growth conifer perch trees at the tip of Tongue Point, just south of the mouth of Mill Creek, and on the north and south tips of the south Tongue Point peninsula. The primary foraging areas for the pair include the mudflat off the mouth of Mill Creek and Taylor Sands (see Estuary Sands Subarea Plan). The Mill Creek site is used more often in winter while the Taylor Sands site is used more often during the nesting season. The pair also forage in the aquatic area around the periphery of Tongue Point and off the southern tip of the south Tongue Point peninsula.

Wintering and transient eagles use the subarea from November through August. Peak numbers occur in March. The perch trees and foraging area off the mouth of Mill Creek are also used by these eagles. This area is used much less frequently by these eagles than perching and foraging areas east of Lois Island (see Cathlamet Bay Subarea Plan).

In and adjacent to the foraging area off the mouth of Mill Creek, the Mill Creek pair exhibit a high tolerance of motor vehicles and trains, moderate tolerance of walking humans, and a very low tolerance of boats. The pair avoids the industrial area except when flying over at high altitudes. High priority measures for protecting this pair within the subarea include complete protection of all of their perching trees along the tip of Tongue Point, south of the mouth of Mill Creek and on the north and south tips of the Tongue Point peninsula and protection of mudflats and marshes off of the mouth of Mill Creek. In

addition, human activities in the vicinity of the foraging areas should be minimized during morning hours.

Aquatic and terrestrial mammals utilize the marshes and swamps of the subarea. Muskrat and nutria feed and den in the marshes and occasionally utilize the swamps. Beaver and raccoon feed and den in the swamps and deer feed in the swamps and adjacent upland.

#### 4.25.3. Shoreland Features

From north to south, the shorelands of this subarea include the steep, forested slopes of Tongue Point itself, the relatively flat developed area occupied by the Coast Guard station and the former naval base, the sloped area waterward of Highway 30 between Mill Creek and the south Tongue Point peninsula, and the south Tongue Point peninsula. Almost all of the flat lands of this subarea are the result of filling former aquatic areas with dredged material.

The flat land on the north Tongue Point peninsula is mostly developed. The developed flat land forming the south Tongue Point peninsula consists of a Corps of Engineers field station and access roads. The remainder of this area consists of vegetated shorelands with some nontidal wetland. The boundaries of the nontidal wetland were surveyed by the Corps of Engineers in 1987. Tongue Point proper consists of a steeply sloping hill. The point contains basalt rock. Vegetation on Tongue Point consists of old growth coniferous forest.

Wildlife in the subarea include deer and small mammals. As discussed under Aquatic Features, bald eagles utilize the subarea. Although there are currently no active eagle nests in the subarea, a nest tree on Tongue Point was occupied in the early 1970's. The trees at the tip of Tongue Point are used for roosting.

#### 4.25.4. Human Uses

##### North Tongue Point Peninsula:

The peninsula is mostly undeveloped with the exception of a Coast Guard installation on the southwest corner. Tongue Point has been designated a habitat area for the bald eagle by the U.S. Fish and Wildlife Service. There is an access road circling the point between the Job Corps Center on the southeast corner and the U.S. Coast Guard installation on the southwest corner.

##### The Naval Station, Job Corps Center and Finger Pier Area:

The Federal Job Corps Center occupies the area immediately adjacent to Tongue Point Road on the west and between Tongue Point Road and the

railroad tracks. East of the railroad tracks there is a large level area which was used as a naval station at one time. The north portion of this area is under Federal ownership, the south portion is owned by the State of Oregon and administered by the Division of State Lands. The finger pier area has been used for long-term storage of vessels. The aquatic area between the finger piers is used for log storage as well.

#### South Tongue Point Mediation Agreement Area:

Constructed out of dredge material, this area is enclosed by water on three sides and by railroad tracks on the south. It is almost undeveloped with the exception of a U.S. Army Corps of Engineers installation. The lower areas have a high water table and contain wetland vegetation.

#### 4.25.5. Issues

The Tongue Point subarea contains one of the most difficult conflicts between natural resource values and development potential in the Columbia River Estuary. The subarea receives extensive use by bald eagles. The aquatic area is productive for several fish species, including shad, Chinook salmon, and starry flounder. The area around south Tongue Point contains tidal marsh and wetland habitat.

There have been a number of proposals for water-dependent uses at Tongue Point. A mediation agreement was reached by representatives from state and federal resource agencies and local jurisdictions in 1981. The Agreement designated use zones and development requirements for Tongue Point. It provides for the potential development of water-dependent uses in the finger pier area by designating the aquatic area between the finger piers, for the access channel, and for a turning basin. A determination of dredged material disposal sites for excavation of the access channel and turning basin and mitigation sites for filling of the aquatic area was not made. Major issues involved in proposals for water-dependent uses at Tongue Point include the dredging of access channels, disposal of the dredged material, the filling of wetlands in and around Tongue Point, protection of intertidal habitat, the impact of access road construction on residences, and protection of bald eagle habitat.

The development potential of the area around the finger piers is high. The shoreland immediately adjacent to the finger piers would provide a backup area for water-dependent development. The area has good access to Oregon Highway 30 and the Burlington Northern railroad tracks. The 1981 Mediation Panel Agreement permits filling of the area between the piers and construction of access channels from the navigation channel to the finger piers. The Agreement also provides for an access channel on the east side of South Tongue Point, and construction of a turning basin.

The 1986 Lower Columbia River Assessment of Oregon Deep Draft Sites identified Tongue Point as a potential deep draft development site. The document included two scenarios for development of Tongue Point. The first scenario, identified as the East Astoria Development Plan, appears consistent with the Mediation Panel Agreement. The second scenario, identified as the Tongue Point Development Plan, involves larger aquatic area fills than specified in the Mediation Panel Agreement. The total Tongue Point Mediation Panel Agreement fills amount to 97 acres while fills under the second scenario amount to 209 acres. The additional fill would occur in areas designated Aquatic Natural. This Plan retains the designations and development scenario specified in the 1981 Mediation Panel Agreement. Redesignation of Tongue Point to allow for the development scenario in the Deep Draft Sites assessment would require full coordination with all of the Mediation Panel participants and other affected agencies.

There are some physical and natural resource constraints to development at Tongue Point. There are steep slopes in much of the area and evidence of landsliding at one site, a factor which may affect access road construction. Extensive wetland areas exist south of the finger piers. In addition, an earthquake fault, possibly no longer active, crosses the area in a northeast/southwest alignment just south of the finger piers.

The federal General Services Administration has considered the possibility of trading ownership of the Tongue Point south peninsula to the State of Oregon in exchange for state ownerships on several estuary islands. The General Services Administration would then transfer its interest in the estuary islands to the U. S. Fish and Wildlife Service. The Oregon Division of State Lands would assume ownership of the Tongue Point south peninsula in addition to existing State ownership in the finger pier area. In addition, Clatsop County would quitclaim its interest in the estuary islands to the U. S. Fish and Wildlife Services. This transaction had not taken place as of 1987.

#### 4.25.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The aquatic area between the shoreline of the old naval station and the waterward end of the finger piers.
2. A channel 500 feet in width from the main navigation channel to the finger piers and out 700 feet from the end of the finger piers.
3. A turning basin 1,000 feet in radius lying immediately waterward of the end of the southerly four finger piers.
4. The aquatic area within the Coast Guard base.
5. The wetland lying south of the Corps of Engineers causeway if South

Tongue Point is used for a water-dependent development. Otherwise the designation is Natural.

6. Tidal wetlands above the fringing emergent marsh lying between the Corps of Engineers dock and the southerly line of T8N, R9W, Section 12, if South Tongue Point is used for a water-dependent development. Otherwise, the designation is Natural.

The following aquatic areas are designated Natural:

1. The subtidal and intertidal areas between the southern most finger pier and the South Tongue Point Peninsula.
2. The wetlands lying south of the Corps of Engineers causeway if South Tongue Point is used for non-water-dependent development.

The following aquatic areas are designated Conservation:

1. The aquatic area between the shoreline of the North Tongue Point peninsula, the navigation channel to the north, and the access channel to the east.

The following shoreland areas are designated Water-Dependent Development:

1. The Coast Guard base.
2. The shorelands between Mill Creek and the Job Corps Center.
3. The South Tongue Point Peninsula can be committed to water-dependent or non-water-dependent developments.

The following shoreland area is designated Development:

1. The Federal Job Corps Center.

The following shoreland area is designated Rural:

1. The potentially unstable slope area waterward of Oregon Highway 30 between Mill Creek and the entrance to South Tongue Point.

The following shoreland area is designated Conservation:

1. A buffer strip between the Job Corps Center and the Tongue Point Peninsula.

The following shorelands are designated Natural:

1. The Tongue Point peninsula north of the Conservation buffer bordering the Job Corps Center; with the exception of the Coast Guard Base.

The steeply sloping potentially unstable area waterward of Oregon Highway 30 between Mill Creek and the entrance to South Tongue Point is designated Rural.

The regulatory shoreland boundary is 50 feet from the Columbia River estuary shoreline except where it extends farther inland to include the following features:

1. The Tongue Point peninsula, because of its significant shoreland habitat.
2. Bald eagle roosting trees in the Mill Creek area and south of Mill Creek to the South Tongue Point Peninsula (waterward of Highway 30).
3. The steeply sloping potentially unstable area waterward of Oregon Highway 30 between Mill Creek and the entrance to the South Tongue Point peninsula.
4. Water-Dependent Development sites at the South Tongue Point peninsula; a designated dredged material disposal site (As-S-18.7); the upland area between the railroad right-of-way and the finger piers north of Mill Creek (also containing a designated dredged material disposal site: As-S-18.2). The Coast Guard base.

#### 4.25.7. Subarea Policies

1. Tidal wetlands south of the Corps of Engineers causeway on the South Tongue Point peninsula can only be developed for improved vehicular or rail access. Otherwise, uses permitted shall conform to the Natural Aquatic designation.
2. Development proposals for the area between the railroad right-of-way and Oregon Highway 30 south of Mill Creek shall demonstrate through such measures as a soils engineering analysis that surface alteration will not result in slope failure.
3. The USFWS and the ODFW shall be contacted prior to any development to assess the potential for impacts on bald eagle habitat.
4. The design and construction of new access roads to the finger pier area shall take into account potential impacts on residences and slope stability.
6. The areas designated Development by the Mediation Panel Agreement can be developed for all uses permitted under that designation, but



compliance with the policies in the agreement shall be required.

Mediation Panel Agreement Subarea Policies - North Tongue Point

6. The maximum extent of fill in aquatic areas at North Tongue Point shall be: from the present shoreline eastward to the end of the existing piers; from the south side of the southernmost finger pier to the northern line of state ownership (halfway between the 5th and 6th finger piers from the south). Fill shall be allowed only for water-dependent uses.
7. A navigation channel 500 feet wide and 40 feet deep (with over-dredge for compatibility with main channel) is allowed to provide access from the Columbia River to North Tongue Point. The width of the access channel may be extended 200 feet (creating a 700-foot wide channel) if necessary to allow movement around vessels docked at North Tongue Point.
8. If the main Columbia River navigation channel is deepened, the access channel into North Tongue Point may be deepened to the same depth.
9. Construction and maintenance of a 1,500-foot wide, 25-foot deep (MLLW) turning basin is allowed. The basin shall be designed to protect productive intertidal and nearshore subtidal areas in the Tongue Point area. The turning basin may extend southward into the MARAD Basin but not south of the existing Corps of Engineers dock at South Tongue Point.
10. The location and dimensions of the access channel and the turning basin shall be determined through engineering studies as a part of the permit application process.
11. Spur railroad trestle access to North Tongue Point from the main line across adjacent wetland areas is allowed. This rail access corridor may also contain piling-supported conveyor or vehicle access facilities for movement of commodities or cargo between South Tongue Point and North Tongue Point (pursuant to the exception to Oregon Statewide Planning Goal 16 adopted by Clatsop County and Astoria).
12. Dredged material disposal sites needed for fill development of North Tongue Point must be identified and agreed upon in pre-application consultation with resource agencies or in the permit process.

Mediation Panel Agreement Subarea Policies - South Tongue Point

13. If South Tongue Point is developed for water-dependent uses, the following accessory activities are allowed:

A) One access corridor from South Tongue Point to North Tongue Point is allowed in addition to the rail access provided in the North Tongue Point agreement. This corridor shall be located adjacent to and waterward of the Burlington Northern Railroad to allow movement of commodities or cargo between the sites. The corridor may contain rail, conveyor, road access, or a combination thereof. If a road is built some fringing wetlands along the shoreland may be filled. Otherwise the corridor must use pile supported structures (pursuant to the exception to Oregon Statewide Planning Goal 16 adopted by Clatsop County and Astoria).

B) A navigational access channel (not to exceed 500 feet in width or 25 feet depth at Mean Lower Low Water) suitable for ocean-going barges is allowed to the eastern side of South Tongue Point. Dredging shall be allowed in this channel to maintain the approved depth not to exceed -25 feet. The objective shall be to locate the channel below -20 feet MLLW and to minimize the amount of dredging required.

C) T-docks or other piling-supported structures are allowed to facilitate movement of commodities from the shoreland to barges or boats in this channel (pursuant to the exception to Oregon Statewide Planning Goal 16 adopted by Clatsop County and Astoria). Such structures shall be designed and located with an objective of protecting productive intertidal and nearshore subtidal areas.

14. Spur railroad trestle access to South Tongue Point from the main line across adjacent wetland areas located southeasterly of the site is allowed (pursuant to the exception to Oregon Statewide Planning Goal 16 adopted by Clatsop County and Astoria).
15. Specific locations of spur lines, transportation corridors, roads, pile-supported structures, and the channel described above shall be determined during the permit process.
16. Filling in the Development Aquatic shrub wetland area lying adjacent to and southerly of the access causeway must meet the use-needs-alternatives criteria of the Section 404 permit process.



## 4.26. JOHN DAY RIVER

### 4.26.1. General Description

This area includes the John Day River from its mouth to the head of tide, and the adjacent shorelands. The subarea is under the jurisdiction of Clatsop County.

### 4.26.2. Aquatic Features

The aquatic portion of this subarea includes the John Day River and adjacent tidal marshes. Diking activities have reduced the amount of tidal wetlands in this subarea. Prior to diking most of the river's floodplain consisted of tidal swamp.

Water depths are a relatively shallow 4 to 12 feet. While the river is considered navigable for a distance of three miles. River flow from the small drainage basin is low, particularly in the summer. There is minimal sediment transport, and flushing is slow. There is little salt water intrusion. The aquatic ecosystem of the John Day River is thus freshwater in nature.

Tidal swamps and marshes exist near the mouth of the river and near the upstream end of tidal influence. These tidal wetlands have plant species similar to those found in Cathlamet Bay wetlands (see Cathlamet Bay Subarea Plan).

There is no information on invertebrate populations in the subarea and little information on fish. During the fall, there are cutthroat trout, some coho salmon, and maybe a small number of Chum salmon. During May and June, there is a run of American Shad which spawn around the head of tide. Other species which occur throughout the year are carp, largemouth bass, crappie, yellow perch, catfish, and other rough fish.

Bird and mammal use of the river's waters and wetlands is probably similar to Cathlamet Bay (see Cathlamet Bay Subarea Plan). Bald eagles feed at the mouth of the river. The Aquatic Features sections in adjacent subarea plans discuss these eagles (see Tongue Point and Cathlamet Bay Subarea Plans).

### 4.26.3. Shoreland Features

The shorelands are predominantly diked tidelands used for low intensity agriculture. There are also small forested shoreland areas. Shoreland soils are the Coquille-Tidal Marsh (fresh)-Tolovana Association. These lowlands have high flooding potential (most of the area is within the 100 year floodplain), relatively high ground water level, and moderate agricultural suit-

ability. The shorelands have moderate wildlife value. Deer and elk, along with smaller wildlife, frequent the area and several bald eagle nests have been located in adjacent upland areas.

There are several nontidal wetlands in the subarea that are as significant under Oregon Statewide Planning Goal 17. The wetlands include emergent marshes dominated by sedges (Carex sitchensis, Carex cusickii, and Carex obnupta), Sitka spruce swamps, and shrub swamps.

#### 4.26.4. Human Use

Existing land and water use includes agriculture, forestry, residential use, and recreation. Low-lying shoreland areas are protected by dikes and fourteen tidegates located along the river. Adjacent land uses are mostly related to agriculture and forestry.

Ownership is mostly private with some county, state and corporate owners. There is a public boat launching ramp on county land near the mouth of the river. There are also numerous private docks along the river. Access to the area is by water from Cathlamet Bay and by road from Highway 30.

Relocation of the John Day River bridge was approved by Clatsop County. A new bridge will be constructed slightly downstream of the existing one. The project will involve fill of approximately 1.3 acres of tidal marsh on the west side of the river. The embankment will be stabilized with riprap. The project will require wetlands mitigation.

#### 4.26.5. Issues

There is limited potential for new development on the John Day River and its low-lying shorelands. The river itself is relatively narrow and shallow. Increased river traffic would conflict with existing houseboat uses and worsen the stream-bank erosion problem. The shorelands, being either low and flood-prone or steep and unsuitable for intensive development, also offer little potential for expanded use. Factors which could improve development potential in the future would be the use of low areas for disposal of dredged material and possible relocation of Highway 30. An exception to Oregon Statewide Planning Goal 16 to permit continued houseboat use on the John Day River was approved by Clatsop County in 1983. This exception does not permit expansion of the outside boundaries of the aquatic area "committed to houseboat use" at the time the exception was approved. The Oregon Department of Land Conservation and Development's position on houseboats is that residential uses are not water-dependent and therefore cannot be permitted in aquatic areas. Water quality and navigational access concerns related to existing houseboats may become a more significant issue in the future.

The tidal marsh-mudflat areas just inside the river mouth are very shallow, are flooded on every tide, have significant fish and wildlife values, are publicly owned, and have little potential for development. It is

in the public interest to protect these natural resource values. The low-intensity recreational uses of the river, the fishery resources and wildlife values should be protected while providing for limited development.

#### 4.26.6. Aquatic and Shoreland Designations

The large tidal marsh and mudflat just inside the mouth of the John Day River, to the west of the river channel, is designated Natural. The remaining aquatic areas to the head of tide are designated Conservation.

Shorelands in this subarea are designated Rural in agricultural areas and Conservation in forestry areas.

The regulatory shoreland boundary in this subarea is 50 feet from the shoreline or the inland toe of dikes and associated toe drains, whichever is greatest, except where it extends farther inland to include the following shoreland features:

1. Significant nontidal wetlands as shown on Columbia River Estuary Resource Maps.
2. Significant riparian vegetation along the John Day River to the head of tide, as shown on Columbia River Estuary Resource Maps.

The John Day River Boat Ramp, including parking lot; dredged material disposal sites CC-S-8.6 and CC-S-18.8 (from the Columbia River Estuary Dredged Material Management Plan); and mitigation and restoration sites as designated in the Mitigation and Restoration Plan for the Columbia River Estuary.

#### 4.26.7. Subarea Policies

1. The tidal marsh and mudflats just inside the river mouth have significant fish and wildlife values and are publicly owned. They shall be protected.
2. New, replacement and relocated houseboats may be permitted in the John Day houseboat exception area, subject to local, state, and federal lease and permit requirements, and subject to the exception to Oregon State-wide Planning Goal 16. Approval of new or re-oriented houseboats shall be subject to the following policies:
  - a. Any new or re-oriented floating residence must have a DEQ approved sewage disposal system.
  - b. New or re-oriented floating residences must show an upland parking area off any public road right-of-way.

- c. New or re-oriented floating residences must have an approved lease from the Division of State Lands to occupy the water surface.
- d. Alignment of new or re-oriented floating residences shall be such that navigability on the river is hindered as little as possible.
- e. Maximum building height of new floating residences shall be equivalent to that in the adjacent upland zone.
- f. A distance of 25 feet is required between any portion of the floats of a new or re-oriented floating residence and any existing floating residence.
- g. Any new or re-oriented floating residence shall be sited so that the longer dimension runs parallel with the shoreline.





#### 4.27. JOHN DAY POINT - EDDY POINT

##### 4.27.1. General Description

This subarea extends from John Day Point to Eddy Point. Included are the shorelands along this part of the Cathlamet Bay shoreline, adjacent tidal marshes, the lower portions of Twilight, Mary's, Bear, and Ferris Creeks, and Svensen and Calendar Islands. Most of the mainland shorelands are forested and rural. Svensen Island is diked and used primarily for pasture. Calendar Island consists of tidal marshes and swamps. The subarea is under the jurisdiction of Clatsop County.

##### 4.27.2. Aquatic Features

Aquatic portions of this subarea include the nearshore areas from John Day Point to Eddy Point, the waters surrounding Svensen Islands, and the marshes and swamps of Calendar Island. The principal historic changes that have occurred in the subarea have resulted from diking. All of the subarea's diked agricultural land previously consisted of tidal marshes and swamps.

Physical and biological characteristics of the aquatic areas are similar to those in adjacent subareas (see Cathlamet Bay and Upper Marsh Islands Subarea Plans). Tidal marshes and swamps fringe much of the subarea's shoreline. In addition, large marshes and swamps exist at the mouth of Twilight Creek, adjacent to Mary's, Bear, and Ferris Creeks, and on Calendar Island. The Mary's, Bear, and Ferris Creek wetlands were at one time diked but have returned to tidal influence when the dikes breached many years ago.

Mary's, Bear and Ferris Creeks have small wild runs of cutthroat trout, steelhead, and coho and chum salmon; coho from state hatcheries have been placed in Bear Creek. The creeks and adjacent waters and wetlands receive extensive use by feeding juvenile salmonids.

The subarea receives heavy use by bald eagles. The Mill Creek bald eagle pair (see Tongue Point Subarea Plan), Twilight Creek pair, and wintering and transient eagles feed off of John Day Point. The Twilight Creek marsh and adjacent south channel are feeding areas for the Twilight Creek bald eagle pair as well as wintering and transitory eagles. Calendar Island and adjacent waters are used by a pair of eagles that nest on Karlson Island.

##### 4.27.3. Shoreland Features

Soils from John Day Point to Settlers Point include the Tolovana and the Walluski-Knappa associations. Flood potential is low and there is a seasonally high water table. The soils have a very low suitability for agriculture. Soil movement hazards are present to the west of Twilight Creek. While the movement is not rapid, it is present almost every winter, intruding on Highway 30. The soils in the remainder of the subarea are primarily of

the Coquille-Tidal Marsh (fresh)-Clatsop Association. Soil morphology is to a large extent a result of flooding, a relatively high seasonal water table, and a low slope. Agricultural suitability is moderate.

Shoreland vegetation is characterized by shrub willow, alder, Sitka spruce, and Douglas fir. Wildlife in the area includes blacktailed deer, elk, and small mammals. Freshwater marshes classified as significant under Oregon Statewide Planning Goal 17 are located on Svensen Island and Twilight Creek.

Bald eagle use of the shorelands is high. Several bald eagle nesting and roosting trees (outside of the estuary area) have been identified inland from the subarea. The Twilight Creek nest is located about one-half mile south of the subarea and a large communal roost known as the Mary's Creek roost is located about one and one-half miles south of the subarea. The eagles' main hunting perches in the subarea are located on John Day Point, adjacent to the Twilight Creek marsh, and near Settler's Point.

#### 4.27.4. Human Use

Existing uses in the area are agriculture, forestry, and scattered residential uses. The railroad runs along the shoreline. There are several in-water log storage areas. There is a mixture of state and private ownership. Physical access to the water is limited to private shoreline structures.

#### 4.27.5. Issues

There is limited development potential in the subarea. Some expansion of residential uses in the Burnside area near Settlers Point may occur in the future.

The tidal marshes at the mouth of Twilight Creek (also known as Eskeline Creek) have been intensively studied and are a valuable natural resource. The marshes are primarily in private ownership and are managed for waterfowl hunting by a local club. There are several small docks and walkways giving access to tidal channels cut in the marshes. Low intensity recreation is the dominant use of these marshes. Continued maintenance and possible improvement of docks and duck shacks is expected. Demand for recreation facilities requiring major alterations, however, is not expected.

A major issue in this subarea is whether or not the formerly diked wetlands can be re-diked and placed into agricultural or other use. According to federal, state, and local policy, once areas have substantially reverted to wetland vegetation, repairing dikes and tide boxes is considered new diking. New diking of wetlands for agricultural use could not be permitted without an exception to Oregon Statewide Planning Goal 16. Proposals for restoring abandoned dikes on Mary's Creek and Ferris Creek have been made.

Dikes on the north side of Svensen Island have experienced problems with erosion. A series of pile dikes to retard erosion have been placed near the center of the island. These have not solved all of the erosion problems. Material to maintain the dikes has been difficult to obtain.

#### 4.27.6. Aquatic and Shoreland Designations

All tidal marshes and swamps are designated Natural except for the following which are designated Conservation: marshes around Svensen Island and fringing marshes along the mainland shore south of Svensen Island. All other aquatic areas are also designated Conservation.

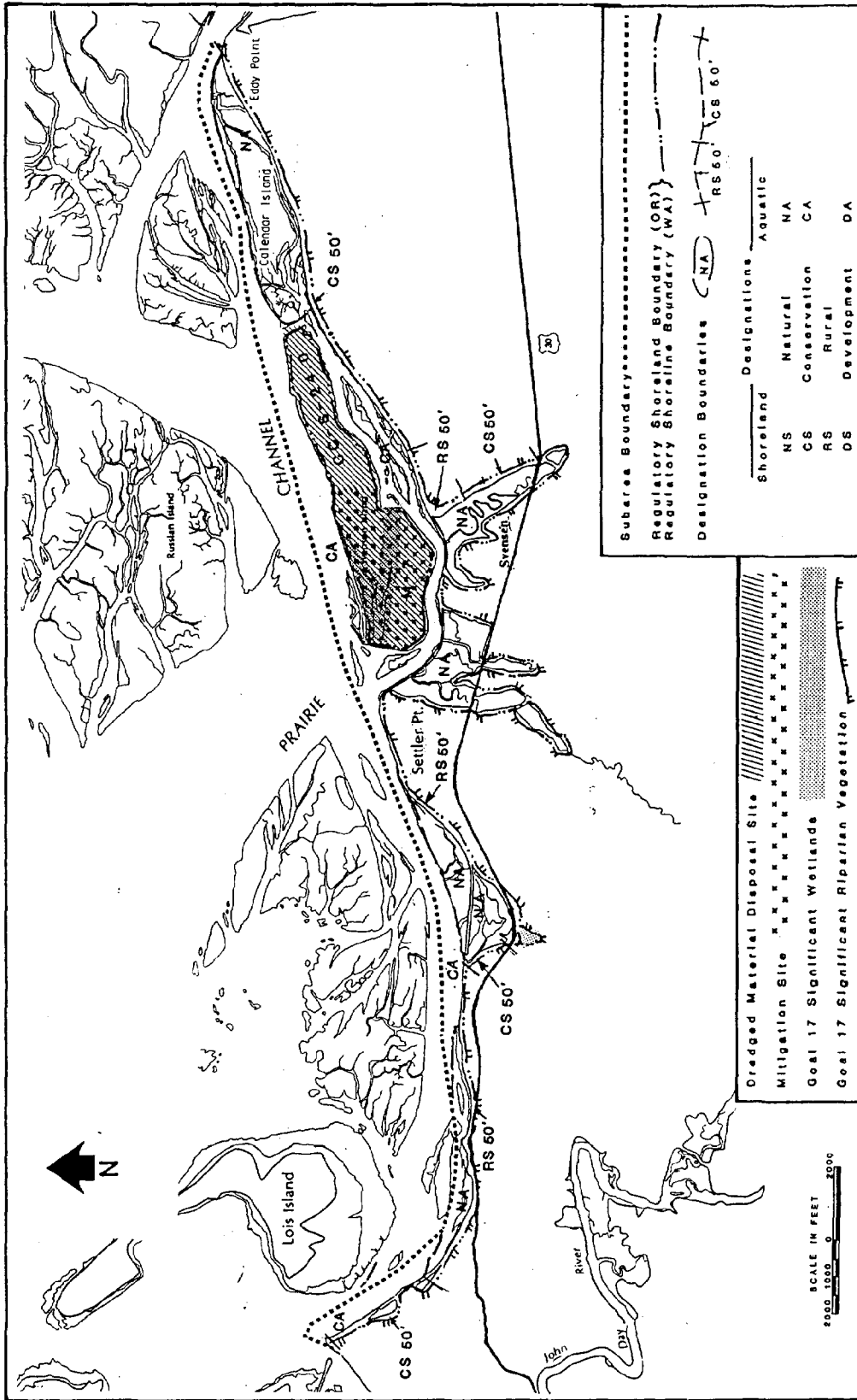
Shoreland areas are designated Rural in agricultural and residential areas and Conservation in forested areas.

The regulatory shoreland boundary in this subarea is 50 feet from the estuary shoreline, or from the landward side of dikes or associated toe drains, whichever is greatest, except where it extends further inland to include the following resources:

Significant wetlands and riparian vegetation identified in Significant shoreland and wetland habitats in the Clatsop Plains and the Columbia Floodplain of Clatsop County, OR 1986.

#### 4.27.7. Subarea Policies:

1. Identified bald eagle roosting trees shall be preserved.



4.27. John Day Point to Eddy Point

#### 4.28. BIG CREEK/LITTLE CREEK/FERTILE VALLEY

##### 4.28.1. General Description

This subarea lies between Eddy Point and Knappa Dock and includes adjacent waters of Knappa Slough, the spruce swamp and tideland soil shorelands at the mouths of Big and Little Creeks, and the diked lands in Fertile Valley. This subarea is under the jurisdiction of Clatsop County.

##### 4.28.2. Aquatic Features

Big and Little Creeks, a large tidal spruce swamp at the mouth of the creeks, and Knappa Slough are all prominent aquatic features of this subarea. There have been few changes to this subarea over the past century. Diking Fertile Valley has converted it from a tidal wetland to pastureland and nontidal wetland.

Physical and biological characteristics of the aquatic area are similar to those in the adjacent subarea (see Upper Marsh Islands Subarea Plan).

The approximately 125 acre tidal spruce swamp at the mouth of the Big and Little Creeks is undisturbed Sitka spruce forest, dominated by a large, open-growth form of Sitka spruce and some red alder, vine maple, salmonberry, skunk cabbage, sedges and waterparsley. A variety of other wetland plants are also present.

A state salmon hatchery on Big Creek releases Chinook salmon, coho, and steelhead. The stream occasionally has a run of lamprey and has a wild population of cutthroat trout. Little Creek fish runs are primarily strays from Big Creek.

##### 4.28.3. Shoreland Features

The primary soil in this area is the Coquille-Tidal Marsh (fresh)-Clatsop Association. Portions of Little Creek flow through a group of soils known as the Nehalem Association. The upper part of Fertile Valley Creek flows through Walluski-Knappa Association. Many of the soils' characteristics are similar, but the primary difference is the agricultural suitability: the Nehalem and Walluski-Knappa Associations are mostly Class II soils, while the Coquille-Tidal Marsh (fresh) Clatsop Association is Class III and IV. The primary hazard in the area is the potential of flooding of the creeks, which also occurs upstream of tidal areas.

Shoreland vegetation includes primarily pasture grasses mixed with wetland plants such as common rush (Juncus effusus). There are also some forested areas.

Fertile Valley Creek is diked with a tidegate near its mouth where it joins Warren Slough. The area is a private wildlife reserve and receives significant wildlife use. Ducks and geese are common and nesting areas have been provided. No fishery information is available on Fertile Valley Creek, but warm water fish are probably common.

#### 4.28.4. Human Use

Agriculture on shorelands in the upper portion of the subarea is the most intensive human use. There is forestry on adjacent shorelands and recreational fishing in Big Creek is important farther upstream. Part of Fertile Valley is a privately owned wildlife refuge.

#### 4.28.5. Issues

The major issue in this subarea is the need for protection of the old growth spruce swamp at the mouth of Big and Little Creeks versus private property rights. The area has been inventoried by the Nature Conservancy and, based on its natural values, recommended for protection. Most of the spruce swamp is in a single corporate ownership (Boise Cascade), with a small portion in private farm ownership near the upper tidal reaches between the two streams. Both landowners object to a protective land use designation which would prevent their use of the area for forestry.

The waters of Knappa Slough adjacent to Big and Little Creeks are important holding areas for adult anadromous fish prior to ascending the streams to spawning grounds and the hatchery. This area should be protected from conflicting uses. The Knappa Slough area has significant historical and archaeological value. The shoreline of the slough was the site of an Indian village. The present Knappa Dock is also the first landing site of the Lewis and Clark expedition in Clatsop County.

The Knappa dock area, midway between public water access points on the John Day River and at Aldrich Point, has been proposed as a possible public boat launch site. Because of the inability of local roads to handle increased traffic and impacts on area residents and lifestyle, this has been opposed by some local residents.

#### 4.28.6. Aquatic and Shoreland Designations

The entire spruce swamp and portions of Big and Little Creeks running through the swamp are designated Natural. The wetland area north of the railroad at Eddy Point on the west is designated Conservation.

Shorelands from Eddy Point east to the spruce swamp and shorelands along the western and eastern edges of the swamp in forestry use are designated Conservation. Areas in agricultural use south and east of the spruce swamp

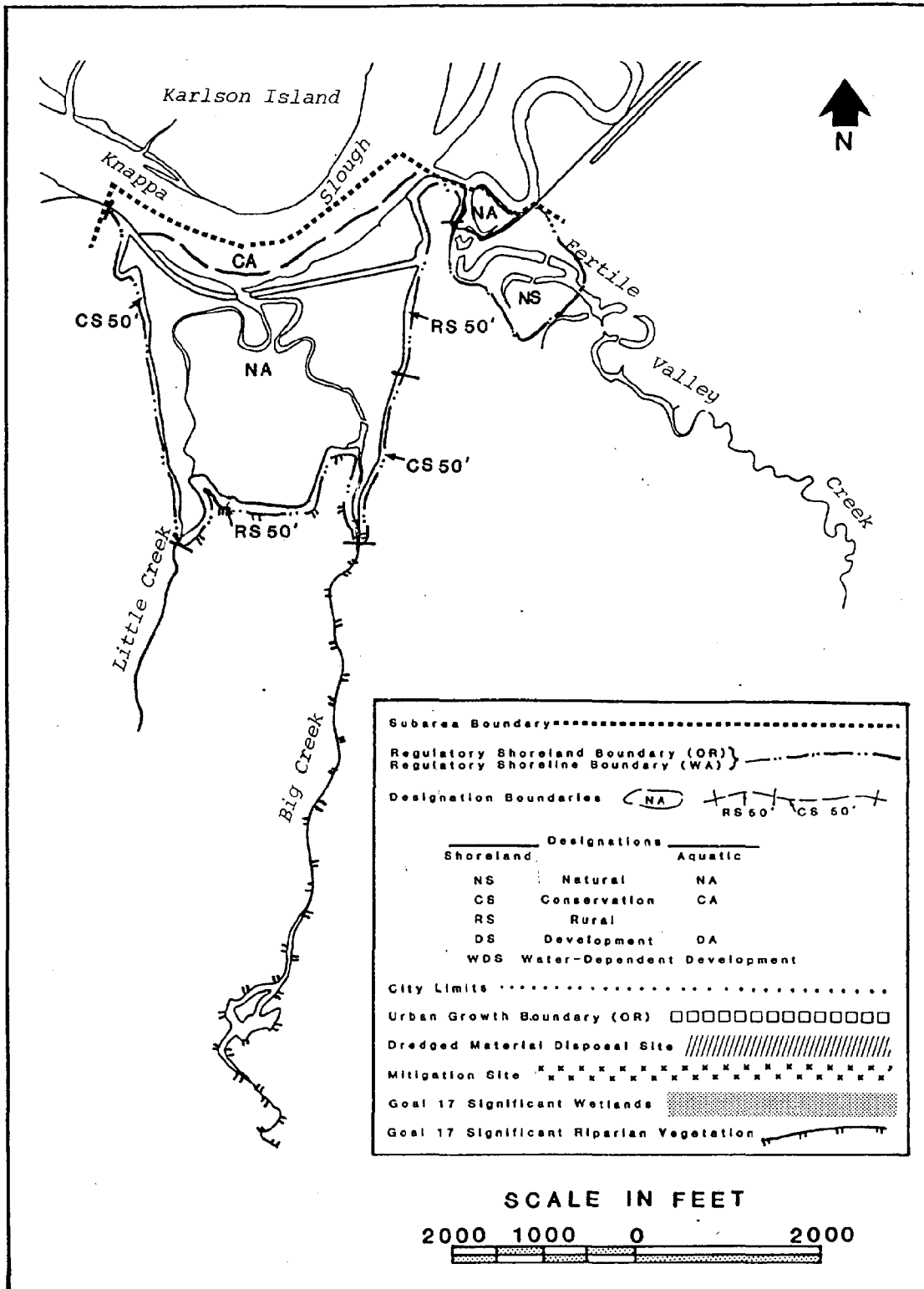
are Rural. The privately-owned wildlife refuge in Fertile Valley is designated Natural.

The regulatory shoreland boundary in this subarea is 50 feet from the estuary shoreline, or the inland toe of dikes and associated toe drains, whichever is greater, except where it extends farther inland to include the following features:

1. Significant riparian vegetation along both sides of Big Creek to the head of tide; and significant riparian vegetation along the Columbia River shoreline near Eddy Point, as shown on Columbia River Estuary Resource Maps.
2. A privately-owned wildlife refuge consisting of lands below the 100-year flood level bounded by Knappa Road on the west, and by Ziak-Gnat Creek Road on the east and south.

#### 4.28.7. Subarea Policies

1. The Natural designation of the Big Creek spruce swamp recognizes the unique natural fish and wildlife values of this area. However, such a designation should not limit logging of adjacent shoreland and upland areas in accordance with the Oregon Forest Practices Act, and should not impede construction of a log sorting yard or similar support facilities on the uplands adjacent to the swamp.
2. The Natural designation on the privately owned portion of wetland south of Blind Slough expressly provides for construction of a single residence at some future time on a piece of higher ground near the railroad. The residence would provide for a caretaker of the area, which is intended as a wildlife preserve.



Subarea Boundary .....  
 Regulatory Shoreland Boundary (OR) } .....  
 Regulatory Shoreline Boundary (WA) } .....  
 Designation Boundaries (NA) (RS 50') (CS 50')

Shoreland		Aquatic
NS	Natural	NA
CS	Conservation	CA
RS	Rural	
DS	Development	DA
WDS Water-Dependent Development		

City Limits .....  
 Urban Growth Boundary (OR) [square symbols]  
 Dredged Material Disposal Site [diagonal hatching]  
 Mitigation Site [cross-hatching]  
 Goal 17 Significant Wetlands [stippled area]  
 Goal 17 Significant Riparian Vegetation [wavy line]



4.28. Big Creek/Little Creek/Fertile Valley



#### 4.29. BROWNSMEAD/GNAT CREEK

##### 4.29.1. General Description

The Brownsmead/Gnat Creek subarea includes all of the lands behind the Brownsmead dikes, all sloughs and wetlands behind the dikes, Blind Slough and adjacent wetlands, Gnat Creek, and Prairie Channel waters and wetlands fronting the subarea. This subarea is in Clatsop County.

##### 4.29.2. Aquatic Features

The aquatic portions of this subarea include parts of Knappa Slough and Prairie Channel, Warren Slough, Blind Slough, and Gnat Creek. Diking activities have brought about large changes to this subarea in the past century. Prior to diking, the Brownsmead area consisted of tidal marsh and swamp.

Physical and biological characteristics of the aquatic area are similar to those in the adjacent subarea (see Upper Marsh Islands Subarea Plan). The freshwater wetland areas north and south of Blind Slough are some of the largest undisturbed tidal spruce and shrub swamps along the shoreline of the estuary. Natural resource values are high. The areas have not been extensively studied but the vegetation and wildlife use is probably similar to the Big Creek area. Sitka spruce, willow and alder make up the overstory with low wetland vegetation as an understory. Knappa Slough has been inventoried by the Nature Conservancy, and its tidelands, fringing marshes and riparian vegetation are described as valuable fish and wildlife habitat.

The fisheries value of the Gnat Creek area is very high. The Gnat Creek Fish Hatchery supports steelhead sport fishing in the creek. Most of the fish raised at the hatchery are transported and released at the other streams in Oregon. Gnat Creek also supports a good run of fall Chinook, and some coho, cutthroat, and chum.

The Brownsmead/Gnat Creek aquatic areas are within the home range of three nesting pairs of bald eagles: the Karlson Island, Marsh Island, and Aldrich Point pairs. There is an osprey nest in the Gnat Creek tidal wetlands.

##### 4.29.3. Shoreland Features

The shorelands consist of Class III and IV soil types of the Coquille-Tidal Marsh (fresh)-Clatsop Association. There are large areas of peat and organic soils. The lowlands are protected by dikes and five tidegates.

Shoreland vegetation consists mostly of upland grasses in large pastures of the subarea. Some of these areas have developed wetland vegetation

such as common rush (Juncus effusus). The diked sloughs within the shoreland are lined with riparian vegetation such as willow and alder.

There is a population of warm water game fish such as bass, crappie, and perch in Brownsmead Slough. Other sloughs also have populations of warm water fishes.

Wildlife values in and around the sloughs are high. Waterfowl use these sloughs as well as the surrounding pastures.

#### 4.29.4. Human Use

Existing uses include farming and rural residences. Portions of Blind Slough and Prairie Channel are used for log storage. Ownership is entirely private except for small parcels in state and county ownership. Recreational use of the aquatic area is high, including hunting and fishing.

There are several water access points. Private docks are located mainly on Blind Slough. There is a public boat launching facility at Aldrich Point, which receives extensive use, particularly in the summer.

#### 4.29.5. Issues

The Brownsmead area, according to the U. S. Soil Conservation Service, has the best agricultural land in Clatsop County. Most of the area is used as pasture land, but corn, peas, beans and other crops are also grown. The area is in the Exclusive Farm Use zone (EFU).

The public boat launching facility at Aldrich Point is a source of conflict in the area. Local residents do not want the facility expanded because traffic generated by the facility already causes problems during peak use periods. The County government operates the facility and has expressed plans for improving the boat ramp.

The bulk of the wetlands north and south of Blind Slough are owned or leased by Western Transportation Company, with the remainder in a small private ownership. These undisturbed wetlands have high natural values and need protection.

Blind Slough, Prairie Channel and Knappa Slough are among the more important log storage areas in the estuary. Water quality is good, the water is deep enough so that grounding at low water is not a problem, and there are no gillnet fish drifts in the area.

Gnat Creek, with its wetlands, riparian vegetation and important fishery, needs protection from major alterations. Some of the wetlands are formerly diked areas, but no dike restoration has been suggested. Some pressure exists for installation of private docks. The recreation value of the stream for sport fishing is high.

#### 4.29.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Natural:

1. The wetlands north and south of the mouth of Blind Slough.
2. The wetlands adjacent to the eastward bend in Prairie Channel.
3. The tidal marshes and swamps associated with Gnat Creek.

All other aquatic areas are designated Conservation.

All shorelands are designated Rural.

The regulatory shoreland boundary in this subarea is 50 feet from the estuary shoreline, or the inland toe of dikes and associated toe drains, whichever is greater, except where it extends farther inland to include the following features:

1. Significant riparian vegetation along the tidegated portions of Blind Slough, Saspall Slough, Grizzly Slough, and other tidegated sloughs in the Brownsmead area; significant riparian vegetation along both sides of Gnat Creek to the head of tide; and significant riparian vegetation along a tidegated slough in Sections 4 and 9, T 8N R7W.
2. Significant wetlands of diked sloughs including Blind Slough, Grizzly Slough, Saspall Slough and other unnamed sloughs as shown on Columbia River Estuary Resource Maps.
3. A boat ramp on Blind Slough, a boat ramp on Gnat Creek, and the Aldrich Point boat ramp.

#### 4.29.7. Subarea Policies

1. Maintenance and possible expansion of log storage activities in Blind Slough are provided for in this plan. This area is well protected from winds and river currents, has relatively deep water and is one of the most important log storage areas in the estuary. The Natural designation of the adjacent spruce swamps at the mouth of Blind Slough are intended to provide for protection of the natural vegetation and wildlife values, while not limiting adjacent log storage and transport activities. Logging in the swamp area shall not be permitted.



#### 4.30. CLIFTON CHANNEL

##### 4.30.1. General Description

This subarea consists of a shoreland strip from Aldrich Point to Bradwood. The area also includes the Columbia River to the center of the Clifton Channel. This subarea is in Clatsop County.

##### 4.30.2. Aquatic Features

The aquatic physical and biological characteristics of the deeper part of Clifton Channel, are, for the most part, similar to the River Channels Subarea. Because sediments are finer in the Clifton Channel than the Main Channel, benthic organisms tend to be more concentrated.

The nearshore parts of the channel contain some narrow, fringing tidal flats and swamps. Subyearling fall Chinook salmon migrate along the nearshore tidal flat and shallow subtidal areas. Two nesting pairs of bald eagles perch and feed in these nearshore areas. Their nests are located within the subarea's shoreland. The tidal swamps of the subarea provide habitat for small mammals and waterfowl.

##### 4.30.3. Shoreland Features

Most of the shorelands in this subarea are steep, heavily forested and subject to landslide hazards, particularly adjacent to Clifton Channel. Vegetation on these shorelands and adjacent uplands is mostly Douglas fir and hemlock. Small pockets of tideland soils occur along Clifton Channel, vegetated with conifers, alder and willow. Wildlife using shore and uplands include deer, elk, bear and smaller animals. Two bald eagle nests are located near Aldrich Point. The eagles using the nests are referred to as the Aldrich Point Pair and Clifton Channel Pair. Their home ranges extend over the adjacent islands.

##### 4.30.4. Human Use

Forestry and some residential uses occur in this area. The old fishing community of Clifton is still occupied by several families and is used as a staging area for fishing the Clifton Channel gillnet fish drifts. Extensive log storage sites are located across the channel adjacent to Tenasillahe Island.

#### 4.30.5. Issues

The fish drifts in this area are very productive, but are hampered by snag material. Most of these obstructions are sinker logs from log rafts stored across the channel. Occasional broken log bundles also cause serious problems, resulting in lost fishing time and expensive snag removal from drifts. This issue is dealt with in the Regional Policies (Subsection 3.3.10.), and local fishermen are working with lumber companies to alleviate the problem.

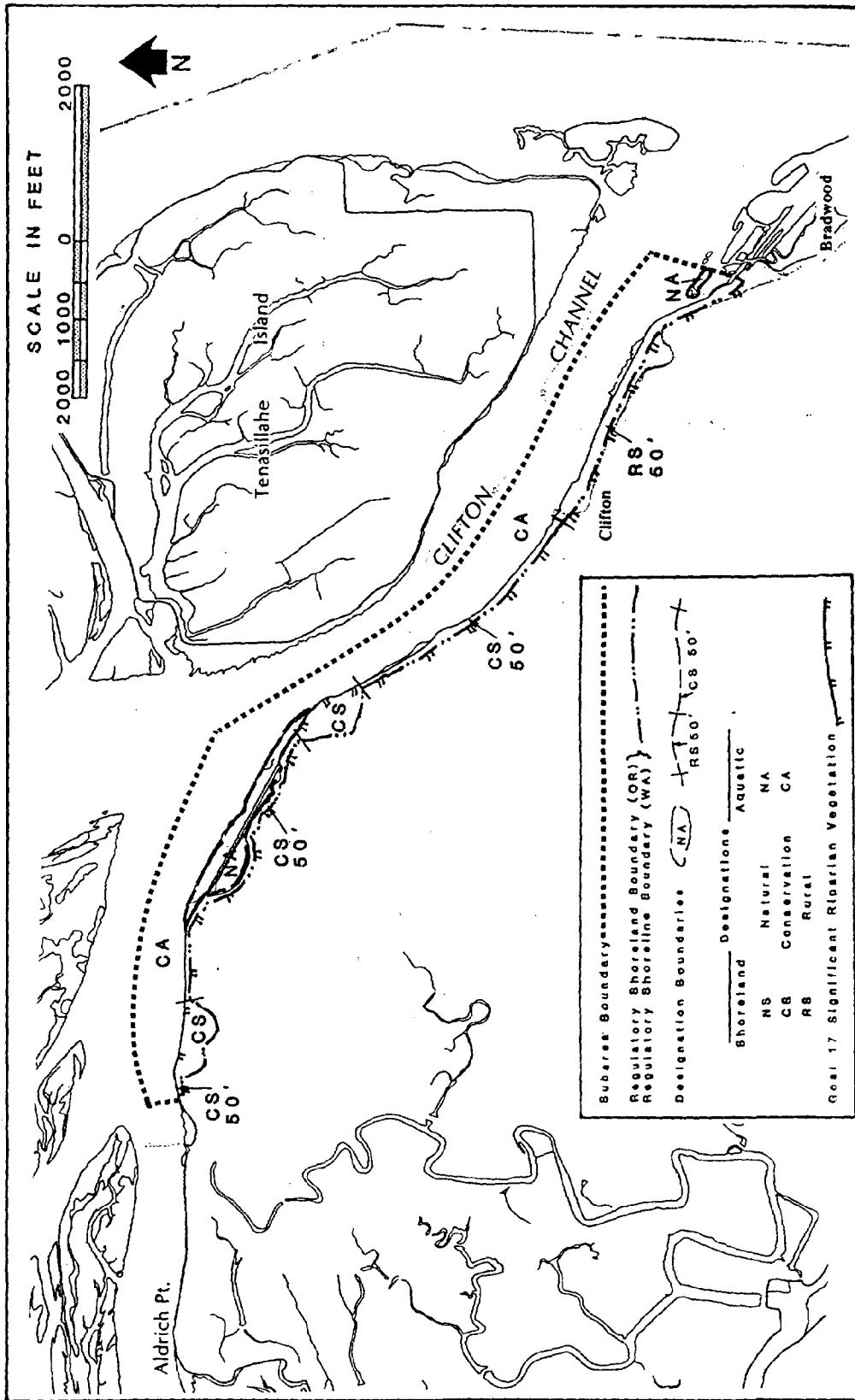
#### 4.30.6. Aquatic and Shoreland Designations

All aquatic areas along Clifton Channel are designated Conservation.

Shoreland areas in forestry use or hazard areas are designated Conservation. The developed area at Clifton, southeast to Bradwood, is designated Rural.

The regulatory shoreland boundary in this subarea is 50 feet from the shoreline, except where it extends farther inland to include the following:

1. Bald eagle nest trees and a 500-foot buffer extending around the trees.



4.30. Clifton Channel

#### 4.31. BRADWOOD

##### 4.31.1. General Description

This area includes the industrial area at Bradwood, a stretch of steep forested shoreline to the east, and portions of the Columbia River. This subarea is in Clatsop County. The eastern boundary is the section line between Sections 21 and 22 of T8N, R6W, which corresponds to the downstream end of Puget Island.

##### 4.31.2. Aquatic Features

The aquatic portions of this subarea include portions of Clifton Channel, the main navigation channel, and tidal marshes and swamps near Bradwood. The biological and physical characteristics of the aquatic area are similar to those in adjacent subareas (see River Channels and Clifton Channel Subarea Plans).

##### 4.31.3. Shoreland Features

The soils in this subarea include the Hembre-Klickitat Association (30% - 60% slope) in the Bradwood area, and the Astoria-Hembre-Klickitat Association (3% - 30% slope). The industrial area at Bradwood has been filled with sandy dredged material.

The vegetation on the Bradwood Cliffs is mostly Douglas fir and hemlock. This serves as habitat for deer, elk, bear, small mammals and furbearers, and birds.

##### 4.31.4. Human Use

The Bradwood industrial site is not currently used. It is designated as a dredged material disposal site. Bradwood is privately owned. The shoreline area between Bradwood and Wauna is forested.

There are private access points to the river in this reach. River use includes sport fishing, commercial fish drafts, and commercial ship and barge traffic.

##### 4.31.5. Issues

The Bradwood industrial site offers limited potential for small to medium sized water-dependent industrial development. There is deep water close to shore, some available vacant land, and railroad access. There are



constraints to development, however, including poor highway access and the proximity of the wildlife refuge. Large-scale development involving extensive dredging or filling would not be appropriate.

#### 4.31.6. Aquatic and Shoreland Designations

The embayment and a 200-foot wide channel out to the main ship channel are designated Development. The remaining aquatic areas are designated Conservation, except where the Development ship channel and its 600-foot wide flowlane disposal area (either 600 feet wide or to the 20-foot bathymetric contour, whichever is narrower) extend into the subarea.

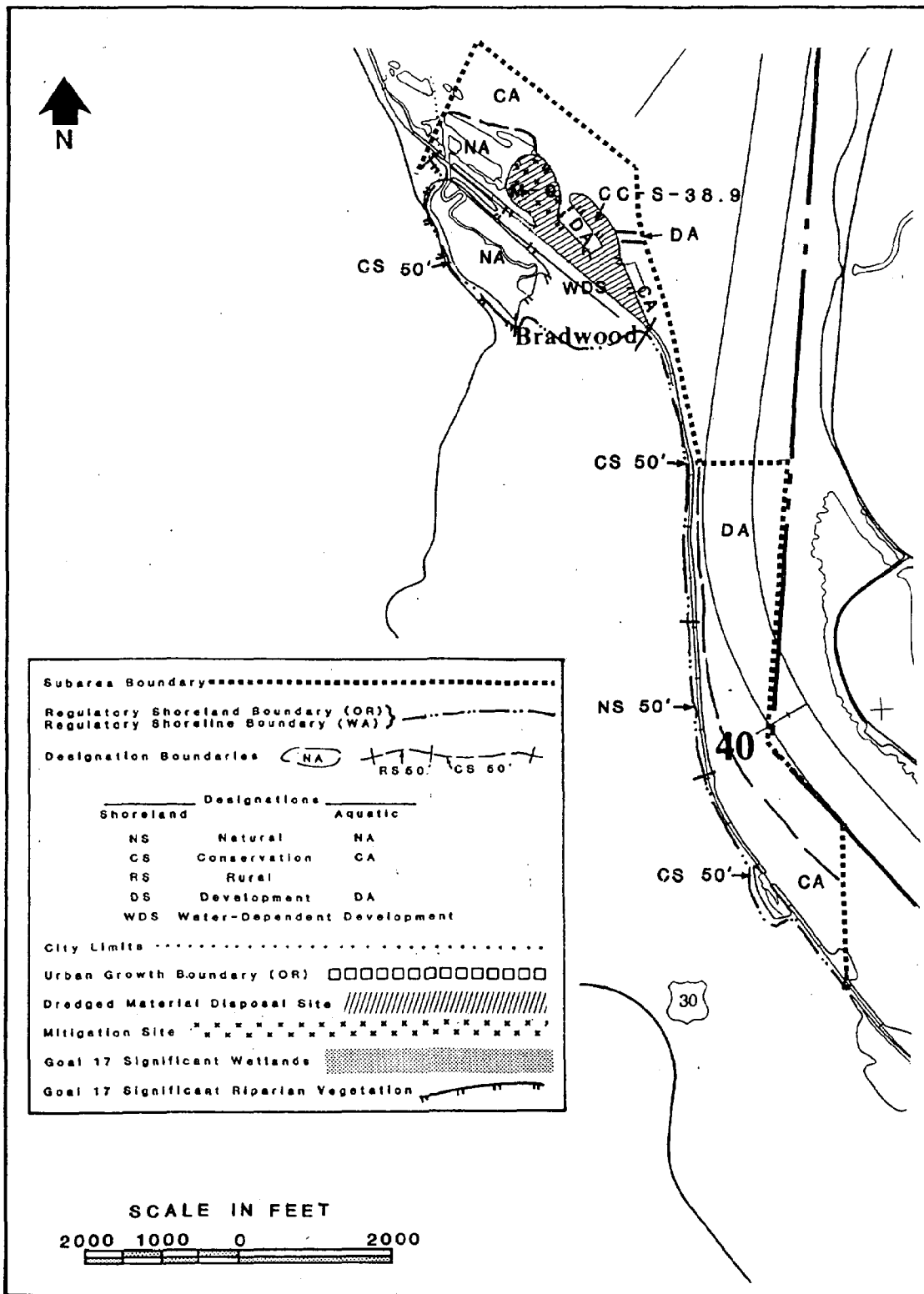
The entire filled area at Bradwood is designated Water-Dependent Development. All other shorelands are designated Conservation.

The regulatory shoreland boundary in this subarea is 50 feet from the shoreline except where it extends farther inland to include the following shoreland features:

1. Significant riparian vegetation around the Hunt's Creek tidal marsh, as shown on Columbia River Estuary Resource Maps.
2. The Bradwood industrial site; dredged material disposal site CC-S-38.9, from the Columbia River Estuary Dredged Material Management Plan; and a mitigation site as designated in the Restoration and Mitigation Plan for the Columbia River Estuary.

#### 4.31.7. Subarea Policies

1. Large-scale development involving extensive dredging or filling at the Bradwood site is not appropriate.
2. The exact location of the 200-foot wide access channel to the Bradwood site is not designated in this Plan. The location of the channel shall be determined at the time of permit application.



4.31. Bradwood

## 4.32. WAUNA/WESTPORT

### 4.32.1. General Description

This subarea includes the Wauna Mill, Driscoll Slough, Westport Slough, the unincorporated community of Westport, and a private recreational home development east of Westport Slough. The subarea extends between the Clatsop/Columbia County line and the downstream end of Puget Island. It extends waterward to the state boundary, and landward to Oregon Highway 30.

### 4.32.2. Aquatic Features

The aquatic portions of this subarea include a portion of the main channel of the Columbia, wetlands and sloughs south of the Wauna Mill, and Westport Slough. This subarea has been altered appreciably during the past century. Much of the present shoreland areas were created by filling or diking tidal swamp.

Physical and biological characteristics of the aquatic area are similar to the River Channels and Clifton Channel Subareas. Nearshore areas tend to be very deep.

The tidal swamp south of the Wauna Mill is vegetated with spruce, willow, and blackberries. The swamp is one of the last remnants of the climax floodplain community that once covered large areas in the region. This area provides habitat for small mammals, deer, and waterfowl. A small population of the endangered Columbia white-tailed deer also use the swamp.

There is little information about the biological and physical characteristics of Westport Slough. The slough supports warm-water game fish. Plympton Creek, which drains into the slough, has a run of fall Chinook and some steelhead, coho, cutthroat, and chum.

### 4.32.3. Shoreland Features

The soils in this area are of the Sauvie-Peat Association. These soils have a low slope, a high flood potential, and a high seasonal water table. They are moderately suitable for agricultural activities. Parts of the property just east of Driscoll Slough and the northern portion of the peninsula have been filled. Shorelands at the Wauna Mill site are developed while most of the other shorelands are undeveloped.

Shoreland vegetation includes shrubs, spruce, cottonwood, and grasses for pasture. Wildlife present include deer (black-tailed and Columbian white-tailed), elk, small mammals, and birds.

#### 4.32.4. Human Use

The Wauna Mill site is heavily developed. There are vacant lands east of Driscoll Slough, a ferry landing and access point on Westport Slough, grazing on the diked land and the southern part of the peninsula, and residential use on the northern portion of the peninsula. Ownership on the mainland portions of this subarea is largely corporate. The unincorporated community of Westport has urban-level services, including sewer, water and fire protection.

#### 4.32.5. Issues

This subarea contains both a high degree of development potential and substantial wetland habitat. With excellent accessibility to the main navigation channel of the Columbia River, the large vacant areas have potential for water-dependent industrial development.

Portions of this subarea are low-lying with considerable wetland habitat value. This is especially true of the area between the railroad and the highway. North of the railroad there are some areas of wetland and a strip of mature riparian vegetation along the west bank of Westport Slough. The area east and north of the community of Westport has been designated by the U. S. Fish and Wildlife Service as critical habitat for the endangered Columbia White-tailed deer.

The planning process involved extensive discussion of the conflict between the habitat values and economic development potential of the area. Resource agencies have agreed that the area has unique development potential but note that the good natural resource values can and should be protected, consistent with development of the area. Development interests have responded that within the very limited areas which are suitable for intensive development, undue restrictions should be avoided.

The portion of Driscoll Slough between the railroad and the river is a water and wetland area which has received considerable attention. During the original CREST planning process, resource agency representatives noted the habitat values, the need to preserve water quality, and the fact that riparian vegetation can be protected without unduly restricting development of adjacent land. A Conservation designation would provide such protection while allowing construction on pilings and minor dredging and filling, which may be necessary for development.

A site between Westport and Driscoll Sloughs has been identified as a potential deep-draft site by a 1986 study for the Oregon Department of Economic Development (Lower Columbia River Assessment of Oregon Deep-Draft Sites, Ogden Beeman and Associates, 1986). A portion of the site has been used for dredged material disposal and it is designated for this use in the 1986 Columbia River Estuary Dredged Material Management Plan. Potential development of this site involves issues of riparian and wetland habitat protection. The development outlined in the Deep Draft Sites Assessment would involve filling 27 acres of wetlands at the site. These wetlands are

significant under Oregon Statewide Planning Goal 5. A 1982 wetlands study (Significant Shoreland and Wetland Habitats in the Clatsop Plains and the Columbia Floodplain of Clatsop County, Oregon (Thomas, 1982) identified wetlands at the site as one of the last remnants of climax floodplain tidal swamp on the lower Columbia River Estuary. Resource agencies have requested protection of this valuable habitat. This Plan recognizes the suitability of this site as a small port facility. Development of the site should be confined to the existing upland area. Any fill in the adjacent wetlands must be justified through the plan amendment process.

Residential property owners across Westport Slough have requested that protection be provided from noise and other impacts of development on the adjacent property.

This subarea includes the Westport Bar shoal in the main ship channel. Large quantities of sand are removed from this shoal each year to maintain required depths. The availability of this fill material coincides with the needs of developers to prepare their land for development. Substantial amounts of material have already been deposited. Disagreement, however, has arisen over continued filling that may impact wetland habitat and riparian vegetation along Westport Slough.

The northern shoreland portion of the peninsula was designated Development in the draft 1979 CREST Plan. However, Rural is a more appropriate designation, given the lack of sewers in the area and the moderate housing density. Portions of the shorelands and wetlands on the peninsula are considered critical habitat for the Columbian white-tailed deer and are to remain undeveloped as part of a zone-change agreement with the River Ranch subdivision developers.

Shorelands east of Westport are diked. There are no immediate development plans and the property will probably remain leased for grazing. Consideration should be given to the area's use by the Columbian white-tailed deer and also the proximity of the property to the community of Westport.

#### 4.32.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The area fronting the Wauna Mill site, the development site southeast of Wauna and Westport Slough, extended to the north subarea boundary;
2. Westport Slough;
3. The main navigation channel and the flowlane disposal area on each side of the channel (600 feet wide or to the 20-foot bathymetric contour, whichever is narrower).

The following aquatic areas are designated Natural:

1. Driscoll Slough;

2. The tidal wetland designated as significant under Oregon Statewide Planning Goal 5.

All other aquatic areas are designated Conservation.

The shorelands area north of Westport Slough is designated Rural. Shorelands south of the railroad track and east of Driscoll Slough are designated Conservation. All other shorelands are designated Natural.

#### 4.32.7. Subarea Policies

1. Development on lands adjacent to Driscoll Slough shall be carried out in a way that will minimize alteration of existing wetlands and riparian vegetation, degradation of water quality and stream sedimentation. Filling or other removal of vegetation for construction of a bridge or other transportation access across the slough shall be the minimum necessary to accomplish the project.
2. Except where direct access to water is required for wharves, docks or piers, riparian vegetation along Westport Slough shall be protected for bank stabilization, wildlife habitat, water quality, and a visual and noise buffer.



#### 4.33. PUGET ISLAND

##### 4.33.1. General Description

This area includes Puget and Little Islands, Coffee Pot Island, Ryan Island, and associated small islands and marshy areas adjacent to the larger islands. The area also includes water out to the state line and to the mid-line of the Cathlamet Channel. Puget and Little Islands are former marsh areas which have been diked and drained for agricultural use. The small adjacent islands are undiked, uninhabited, and are used mostly for recreational hunting and fishing. This subarea is under the jurisdiction of Wahkiakum County.

##### 4.33.2. Aquatic Features

The aquatic portions of this subarea include parts of the main Columbia River Channel and Cathlamet Channel, Bernie and Welcome Sloughs, and the tidal wetlands of Ryan Island, White Island, and on the Puget Island shore. Prior to diking Puget Island to create agricultural land, the island consisted almost entirely of tidal swamp.

Most of the Columbia River flow is concentrated south of Puget Island through the main navigation channel. Tidal range and tidal reversals decrease in this subarea compared with the lower estuary. River stage becomes increasingly important in water level fluctuations.

The subarea contains a wide range of sediment types. The high-energy areas such as Cathlamet Channel and the main navigation channel contain sediments with mean grain sizes ranging from coarse to medium sand. The tidal flats and slopes south of Puget Island contain primarily medium to fine sand. Very fine sand, silt, and clay predominate in the quiet areas such as near the tidal marshes and swamps east of Puget Island.

Of the estuary's plant types, phytoplankton and tidal marsh and swamp vegetation have been studied in the subarea. Phytoplankton productivity levels rank among the highest measured in the estuary. Most of the subarea's low marshes are dominated by reed canary grass (Phalaris arundinacea), Lyngby's sedge (Carex lyngbyei), and cattail (Typha angustifolia). The high marshes consist of a species-rich community of plants. The swamps are dominated by several shrub and tree species; black cottonwood is particularly abundant.

Of the estuary's invertebrate types, only benthic infauna have been studied in the subarea. Infauna densities are high. Fish prey species such as amphipods (Corophium salmonis) and freshwater clams (Corbicula manilensis) are abundant.



The subarea's fish community has not been quantitatively sampled. Fish utilization is presumably similar to that of the River Channels Subarea.

Many species of resident and migratory birds feed and nest in the subarea. Because the subarea contains many different types of habitats, bird species diversity is very high. Double-crested cormorants utilize open waters. Western grebe and other migratory waterfowl species winter in the subarea. Common merganser, a resident waterfowl species, feeds and nests in the subarea. Other waterfowl species that nest in the subarea include mallard, green-winged teal, and wood duck. Shorebirds feed in the tidal flats and low marshes. Great blue heron utilize nesting colonies on Ryan Island (north of Puget Island) and Brown Island (east of Puget Island).

Two marine mammals, harbor seals and California sea lions, feed in the subarea. Their use is concentrated in Cathlamet Channel during the winter eulachon run. Marine mammal use is generally low during other seasons.

The marshes and swamps of the subarea receive aquatic and terrestrial mammal use. Muskrat and nutria feed and den primarily in the tidal marshes of the subarea. Beaver feed and den in the Sitka spruce and willow swamps. River otter utilize the sloughs, small tributaries, and adjacent swamps. Raccoon are abundant in the swamps and in the diked floodplain of Puget Island. Two species of deer, the black-tailed deer and the endangered Columbian white-tailed deer, utilize the subarea.

#### 4.33.3. Shoreland Features

The soils in this subarea have been deposited by the river, and are of the Ocosta silty clay loam type. This soil is relatively impermeable, with a high water table. The vegetation in agricultural areas is mostly grass and row crops, and in other areas is a mixture of willow, alder, and cottonwood. There is residential development along the perimeter dike and roads.

The area provides habitat for the endangered Columbian white-tailed deer, muskrat, nutria, opossums, and other mammals. Migratory birds are common in the area, and many, including the whistling swan, winter here.

#### 4.33.4. Human Use

The existing uses of Puget and Little Islands are agricultural in the interior and rural residential along and waterward of the main ring dike. Housing is particularly concentrated along Bernie, Welcome and Jackson Sloughs, and the Sunny Sands area along the south side of Puget Island. There are a number of small businesses located on the islands'

interiors, as well as small boat building and repair yards. Ownership is primarily private, although there is a large section of state ownership (Department of Natural Resources on Puget Island and Department of Wildlife on White Island). There are public shoreline fishing areas on the west and south sides of Puget Island. In-water log storage areas are present on the north side of Little and Ryan Islands and the south side of Puget Island. There are also a number of commercial fishing areas in Cathlamet Channel, adjacent to the main navigation channel, and in the area between Coffee Pot and Puget Islands. There are several established gillnet drifts in the aquatic portions of this subarea.

#### 4.33.5. Issues

Dairy farming is traditional on these islands, and other types of agriculture also occur. Residential development is occurring, but its expansion is hindered by lack of road access, utility constraints and floodplain hazard. Sand from maintenance dredging of the main navigation channel could be used as fill to enhance development sites. If dredging were to occur at the entrances of sloughs around the islands, shoreline residential development would become more attractive to people owning boats.

Some areas of conflict are the bulkhead permit problems in Bernie and Welcome Sloughs, Diking District-Corps of Engineers policies on dike maintenance, public access to public beaches on White Island, ownership disputes between Department of Natural Resources and private owners over tideland and former shoreland, dredged material disposal practices on and adjacent to Puget Island and in-water activities interfering with gillnet drifts.

Most of the subarea and the small low islands provide fish and wildlife habitat and recreational opportunities. The small islands, with the possible exception of Coffee Pot Island, are unsuitable for development because of their low elevation and flood hazard.

Shoaling in Cathlamet Channel is a concern. Cathlamet Channel is continually changing, with shoaling in some reaches and scour in others. (There was more than 20 feet of scour in the upstream areas between 1957 and 1984.) This constant change is due to tidal reversals and divergence of flows at both ends of the channel. Other changes in recent years, such as the enlargement of the navigation channel, the Mount St. Helens eruption, and upstream regulation which traps sediments and reduces peak flows, also change the river hydraulics and impact the channel. The upstream pile dikes were constructed in the late 1920's and except for the recent growth and stabilization of the disposal area, these are probably not a major cause of the recent shoaling.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of Engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be informed concerning timing and location of in-water activity.

#### 4.33.6. Aquatic and Shoreland Designations

Aquatic portions of Ryan Island that are publicly owned are designated Natural. East of the Puget Island Bridge, a 50 foot Rural Aquatic designation is applied along the perimeter of Little and Puget Islands ending at the downriver end of White Island. Welcome Slough and Bernie Slough are designated Rural. The main Columbia River navigation channel and the flowlane disposal area (600 feet wide on each side of the channel or to the 20-foot bathymetric contour, whichever is narrower) are designated Development. All remaining aquatic portions of this subarea are designated Conservation.

The publicly owned shorelands of Ryan Island are designated Natural. The shorelands of Puget and Little Islands are designated Rural. All remaining shorelands of this subarea are designated Conservation.

The regulatory shoreline boundary is 200 feet landward of the ordinary high water line along the Columbia River, including both sides of Bernie Slough and Welcome Slough.

The following dredged material disposal sites are listed in the 1986 Columbia River Estuary Dredged Material Management Plan:

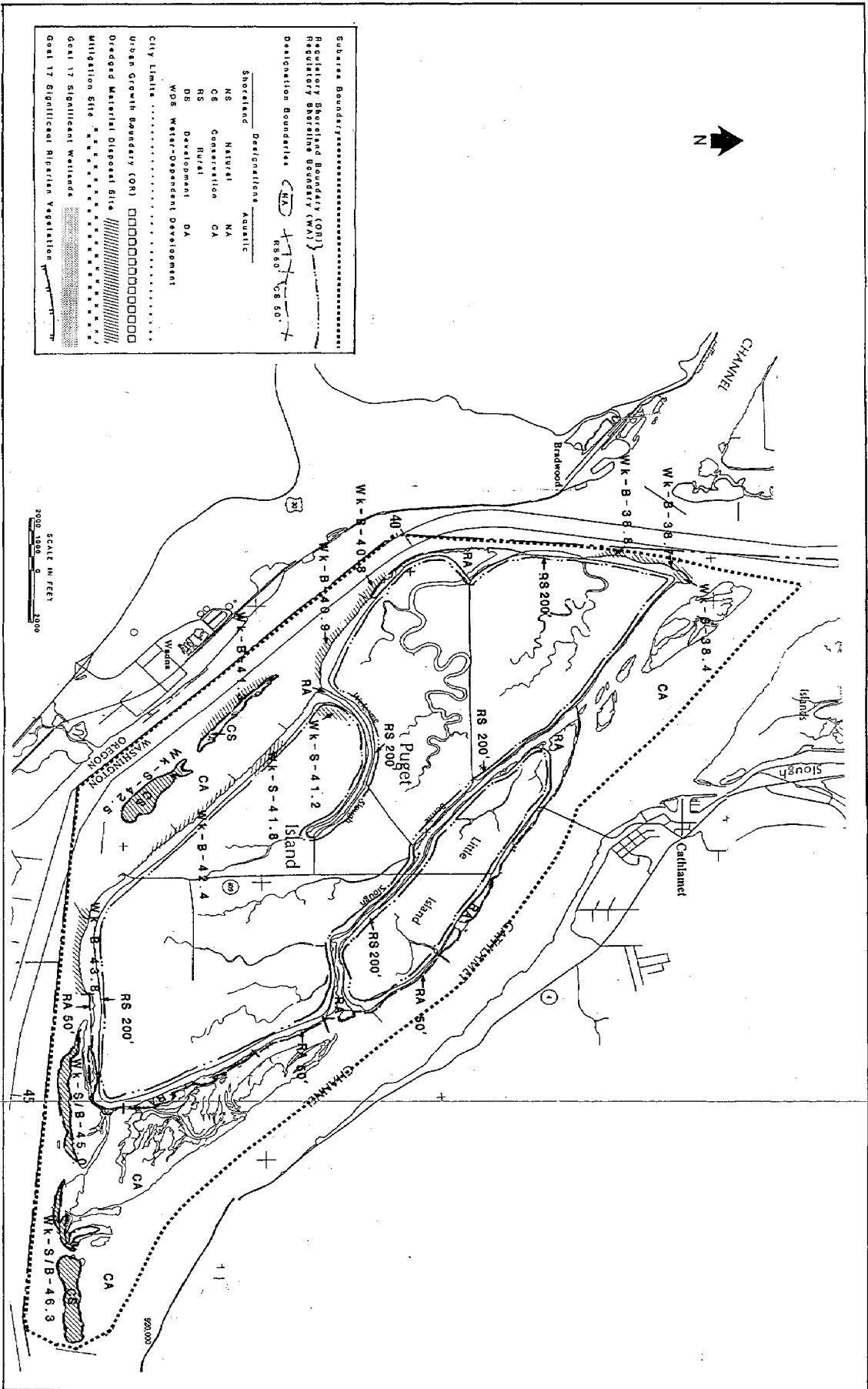
Wk-S-38.4, Wk-S-38.7, Wk-S-38.8, Wk-S-40.8, Wk-S-41.2, Wk-S-41.8,  
Wk-S-42.4, Wk-B-40.9, Wk-B-41.3, Wk-S-42.5, Wk-B-43.8, Wk-S-45.0,  
Wk-B-43.8, Wk-B-45.0, Wk-S-46.3, Wk-B-46.3.

#### 4.33.7. Subarea Policies

1. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift

captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.

2. In-water activities that may leave snags in gillnet drifts shall avoid drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.



#### 4.34. EASTERN WAHKIAKUM COUNTY

##### 4.34.1. General Description

This area includes aquatic and shoreland areas between the eastern boundary of Wahkiakum County and the Puget Island Bridge. The area has generally steep topography; there are no tideland soils. The planning boundary extends from 200 feet landward of the Mean Higher High Water line, and waterward out into the Columbia River to the State line, or to the center of Cathlamet Channel. This area is within Wahkiakum County's jurisdiction, except for a small portion of the Town of Cathlamet east of the Puget Island Bridge.

##### 4.34.2. Aquatic Features

The aquatic portions of this subarea include parts of Cathlamet Channel and the Columbia River Main Channel. Water depths along the shoreline are relatively deep and there is little wetland habitat. Aquatic physical and biological characteristics are similar to those in the channel portions of the Puget Island Subarea.

##### 4.34.3. Shoreland Features

This section of the Wahkiakum County shoreline is characterized by a steep topography of rocky bluffs vegetated by forest. The uplands provide habitat for deer and other upland game. The shoreland from the Nassa Point area to the Puget Island bridge is mostly steep cliffs with a moderately flat bench at the top. The soil along the shore in this subarea is mostly a silt loam derived from sandstone.

##### 4.34.4. Human Use

Human use in much of this area is limited by the steep and often unstable topography and poor shoreline access. The heaviest human activity is concentrated at County Line Park, two small residential areas near Cape Horn, and along State Highway 4, which in some places follows the shoreline. Shoreline ownership is mostly private, with some corporate ownership. County Line Park is a day-use facility for picnicking, swimming, and fishing. There are commercial salmon and smelt fishing areas in the river through this area, limited in-water log storage at Nassa Point, and a rock pit with water access close to Cathlamet.

#### 4.34.5. Issues

Development potential in most of the area is limited by the steep and unstable topography, utility constraints, and the occasional closures of State Highway 4 east to Longview. Industrial activity will probably continue to be limited to minor timber harvest and the commercial rock pit. In-water development will probably continue to be associated with the maintenance of the main navigation channel and limited log storage.

Some conflicts in this subarea are related to navigation. A former dredge spoil site at Flandersville is thought to contribute to the shoaling of Cathlamet Channel. For this reason, Wahkiakum County will no longer grant a permit for the continued use of this site for dredged material disposal.

The Development Shoreland classifications for the Eagle Cliff-County Line Park, Cape Horn-Flandersville and the Nassa Point to Puget Island Bridge areas will provide for the increasing use of these areas for more intense recreation or housing developments.

The shoreland from the Nassa Point area to the Puget Island Bridge is mostly steep cliffs with a moderately flat bench on top. The area within Cathlamet is currently used for housing. It is scenic and has road access. The exception to this is the currently used commercial rock pit with river and road access.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of Engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be consulted concerning timing and location of in-water activity.

#### 4.34.6. Aquatic and Shoreland Designations

The main navigation channel of the Columbia River, including a flowlane disposal area on each side (either 600 feet wide or to the 20-foot bathymetric contour, whichever is narrowest), as well as the Cathlamet Channel (300 feet wide) area designated Development. Remaining aquatic areas are designated Conservation.

Shorelands are designated Conservation from Eagle Cliff to Waterford, and from approximately one-half mile west of Cape Horn to approximately one mile east of Nassa Point. Remaining shorelands are designated Development. The boundary between the Development and Conservation designations is the section line between Sections 17 and 20 of T8N R5W.

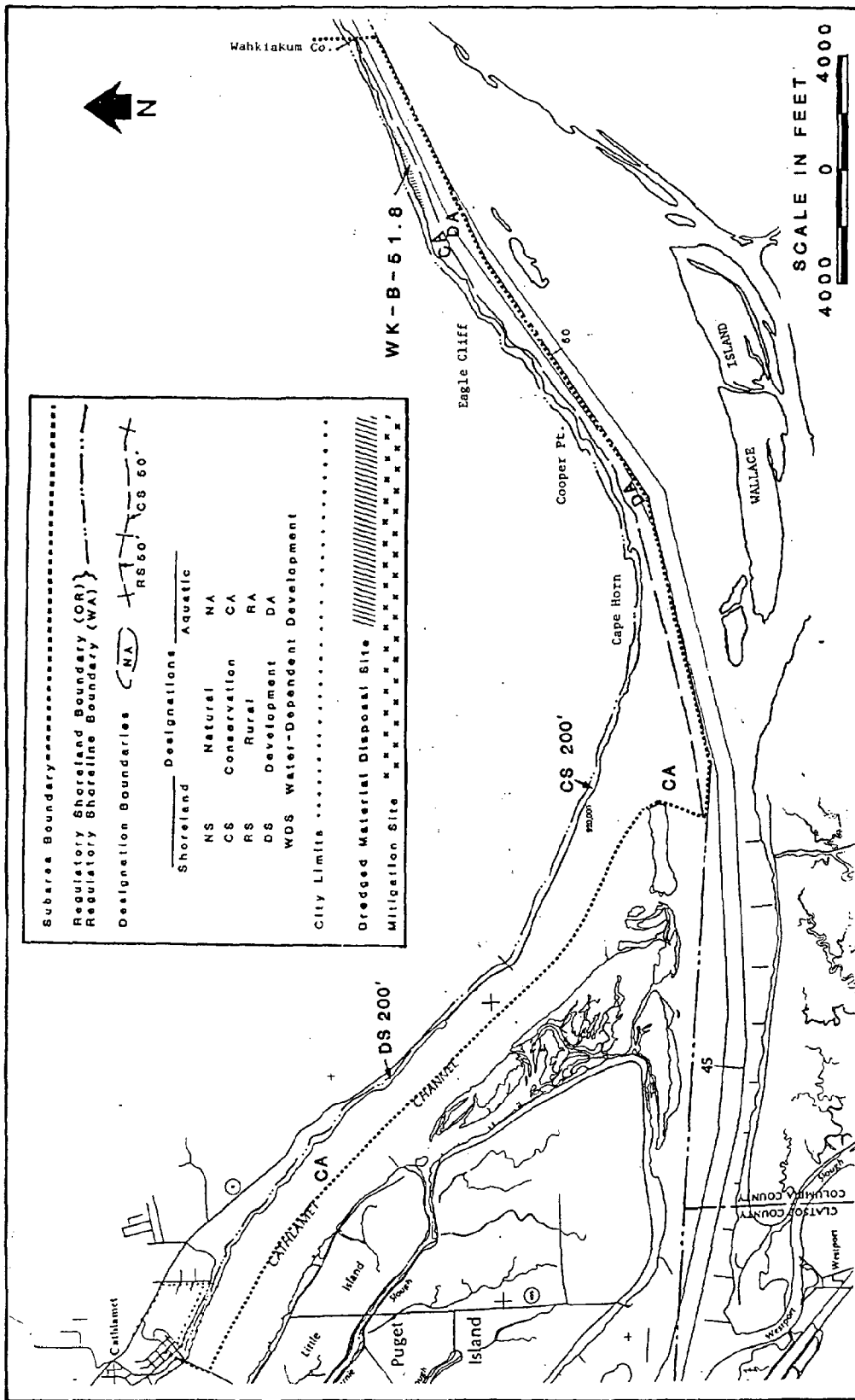
Only one dredged material disposal sites is listed in the 1986 Columbia River Estuary Dredged Material Management Plan for this subarea: Wk-B-51.8.

The regulatory shoreline boundary in this subarea is 200 feet landward of MHHW throughout the subarea.

#### 4.34.7. Subarea Policies

1. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.
2. In-water activities that may leave snags in gillnet drifts shall avoid drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.





4.34. Eastern Wahkiakum County

#### 4.35. CATHLAMET AND WHITE-TAILED DEER REFUGE

##### 4.35.1. General Description

This subarea lies between the Puget Island Bridge and the downstream end of Price Island. Water areas to the state line are also included. Both Wahkiakum County and the Town of Cathlamet have jurisdiction in this subarea.

##### 4.35.2. Aquatic Features

The aquatic portions of this subarea include parts of Cathlamet Channel and the Columbia River Main Channel, Elochoman River and Slough, parts of Brooks Slough and the tidal swamps of Hunting and Price Islands. This subarea has undergone extensive changes in the past century. The diked farmland and refuge land north of the Elochoman River was previously a large tidal swamp.

The physical and biological characteristics of the subarea's channel portions are similar to those in the Puget Island and River Channels Subareas.

Price Island, Hunting Island, and the mouth of the Elochoman River all have large tidal swamps. The vegetation consists primarily of spruce, cottonwood, alder, and willow. Bird and wildlife values are high in the swamps (see Puget Island Subarea Plan). Hunting Island supports some Columbian white-tailed deer. Price Island, Hunting Island and adjacent water areas are used by bald eagles.

The Elochoman River and Beaver Creek, a tributary of the Elochoman, both have salmon and trout runs. Natural spawning grounds for coho and steelhead exist on the Elochoman River. In addition, a hatchery on the Elochoman produces fall Chinook and coho salmon and a hatchery on Beaver Creek produces steelhead and cutthroat trout.

##### 4.35.3. Shoreland Features

Shorelands in this subarea proceed from steep rock bluffs at the Puget Island Bridge, to low wet areas of diked tideland west of the Elochoman River. Price Island contains some sandy dredged spoil shoreland areas. Vegetated areas consist primarily of pastureland and some forested areas. Cathlamet and a log sort yard along Elochoman Slough are developed.

Much of the mainland is part of the Columbian White-tailed Deer Natural Wildlife Refuge and is former agricultural land. The area east of Highway 4 and north of the Elochoman River, and north and east of

Brooks Slough is still in agricultural production. The diked areas contain several large sloughs and some low wetland areas. Wildlife values are high in much of this area. The main part of the Columbian white-tailed deer population exists within the diked refuge area.

#### 4.35.4. Human Use

The Cathlamet vicinity has the largest concentration of industry, commerce, and housing in the County. The Cavenham log sorting yard and log storage areas are the largest in the County. Most of Hunting Island, Price Island, and the agricultural land north of Cathlamet and west of State Highway 4 are in the Columbian White-tailed Deer National Wildlife Refuge.

Intensive human use occurs throughout the Cathlamet-Elochoman Slough area. Cathlamet is the county's main developed water access point. The Elochoman Slough Marina offers waterborne visitors a safe harbor and pleasant place to visit, and may help attract people to Cathlamet. Most of the town is built on a hill and is not included in the estuary plan.

The Cavenham log sorting yard is the major water-related industry in this part of the county. The current site and Elochoman Slough have been used for this purpose for decades and the shoreland has been highly modified as a result. The forested area north of the sorting yard is a possible expansion area.

There is an area to the east of the sorting yard which is used for machine and truck shops. The previously-forested wetland to the east of the sorting yard complex is privately owned and is seasonally grazed by cattle. The lands east of State Highway 4 and north of the Elochoman River are privately owned farmlands as is a parcel outside the Refuge boundary north and east of Brooks Slough.

The lands west of State Highway 4 and north of the Elochoman River are owned and managed by the U. S. Fish and Wildlife Service as part of the Columbian White-tailed Deer National Wildlife Refuge. This land generally is kept in pasture. The Refuge also owns most of Hunting Islands which are maintained in a natural state. Ownership on Price Island is divided between the County, the Refuge, and the State of Washington; the island is in a natural state except for a dredged material disposal site.

The Elochoman Slough Marina and protecting breakwater are part of an authorized project in Elochoman Slough which includes a 100-foot wide by 10-foot deep channel for 1.5 miles above the sewage lagoon, and a turning basin. The mooring basin is maintained at a 6-foot depth with a 50-foot wide entrance.

There are log storage and holding activities, and maintenance dredging in Elochoman Slough in conjunction with the Cavenham sorting

yard. Water quality and benthic habitat in Elochoman Slough are affected by log storage and holding. Decomposing bark creates low oxygen conditions near the bottom.

The Corps of Engineers authorized Cathlamet Channel is 300 feet wide by 10 feet deep.

#### 4.35.5. Issues

Development potential is high along the Cathlamet waterfront and up the landward side of Elochoman Slough to the small slough at the north end of the Cavenham sorting yard. This area is served by maintained navigation channels and existing roads.

Price Island has been identified as critical habitat for the endangered Columbian white-tailed deer by the U. S. Fish and Wildlife Service, and for that use should be managed in a near natural state. The U. S. Fish and Wildlife Service owns the downriver end of the island; the County owns the upriver end; the State of Washington owns a small parcel along Steamboat Slough. Wahkiakum County amended its Shoreline Master Program designation for the upstream portion of Price Island to Conservancy in 1985 because of wetlands at the site and the lack of water shoreland access. The entire island is now designated Conservation.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of Engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be consulted concerning timing and location of in-water activity.

#### 4.35.6. Aquatic and Shoreland Designations

The aquatic portions of the Hunting Islands are designated Natural, except for the wetland along Elochoman Slough adjacent to the Cavenham sorting yard, which is designated Rural. Nelson Creek is designated Rural. The following aquatic areas are designated Development: the main Columbia River Navigation channel (600 feet wide or extending to the 20-foot bathymetric contour, whichever is narrower); the navigation channel in Cathlamet Channel (300 feet wide); a 200-foot wide aquatic area along the shoreline in front of Cathlamet extending from the Puget Island Bridge to the tip of Hunting Island; and the Elochoman Slough from Cathlamet to the Elochoman River. The remaining aquatic areas are designated Conservation.

Shorelands at the Wildlife Refuge are classified Conservation. The agricultural lands in this subarea are designated Rural because of their present and projected future farm use. The shorelands east of State Highway 4 and north of the Elochoman River, and the shorelands north and east of the Refuge between Brooks Slough and State Highway 4 are designated Rural. The shoreland from the Puget Island bridge north along Elochoman Slough, between the slough and State Highway 4 and south of the Elochoman River are designated Development. Price Island is designated Conservation. The remaining shorelands are designated Conservation.

Two dredged material disposal sites are listed in the 1986 Columbia River Estuary Dredged Material Management Plan: Wk-S-38.1, Wk-S-36.9. Site 38.1 would be used in association with dredging of the Cathlamet Boat Basin, and is in a Natural Shorelands designation. Amendment of the local Shorelands Master Program designation for this site would be required to permit disposal of dredged material. Site 36.9 is designated for dredging of Elochoman Slough.

A twenty-acre mitigation site located along State Highway 4 on the north side of the Elochoman River, described in the 1987 Columbia River Estuary Mitigation and Restoration Plan, is included in this subarea.

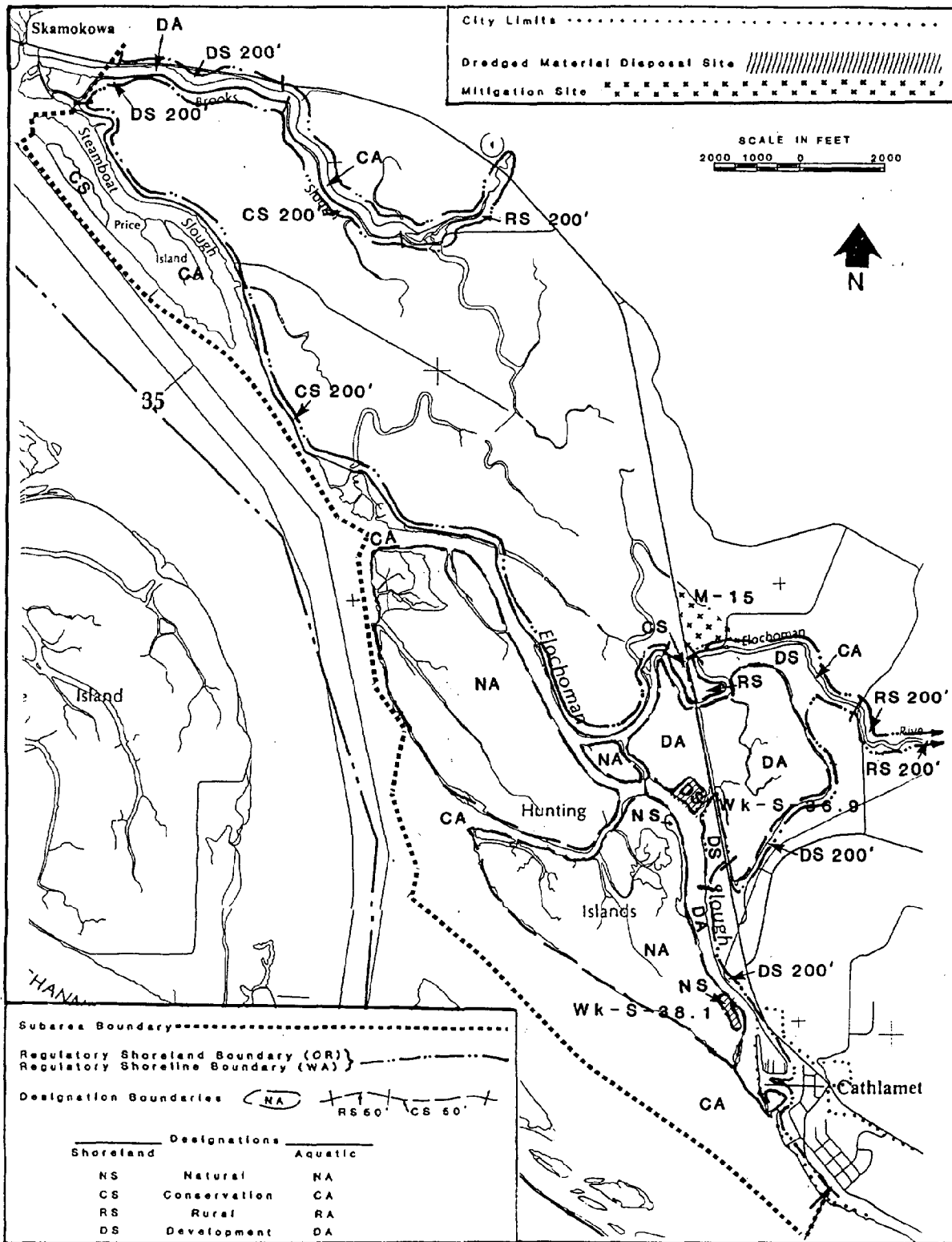
The regulatory shoreline boundary is 200 feet landward of MHHW along the Columbia River, Elochoman Slough, Brooks Slough, Steamboat Slough and the Elochoman River.

#### 4.35.7. Subarea Policies

1. For those shorelands that are designated Development, proposed uses and activities shall be designed to minimize or avoid degradation of fish habitat.
2. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of

Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.

3. In-water activities that may leave snags in gillnet drifts shall avoid drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.
4. The mitigation site in this subarea can be used as mitigation only for projects that provide direct economic benefits to Wahkiakum County.



4.35. Cathlamet/Whitetail Deer Refuge

#### 4.36. SKAMOKAWA TO THREE TREE POINT

##### 4.36.1. General Description

This subarea lies between the northern boundary of the Columbian White-tailed Deer National Wildlife Refuge and Three Tree Point. It includes the unincorporated community of Skamokawa and some agricultural lands along Skamokawa Creek and Dead Slough. The shorelands west of Skamokawa are mostly inaccessible by road and unpopulated. This subarea is under the jurisdiction of Wahkiakum County.

##### 4.36.2. Aquatic Features

The aquatic portions of this subarea include part of the main Columbia River Channel, Skamokawa Creek, and part of Brooks Slough. Diking and filling activities over the past century have altered parts of the subarea. The floodplain of Skamokawa Creek, now protected by dikes, once contained large tidal swamps. Tidal swamps west of the creek's mouth were also diked and filled during the past century.

The aquatic physical and biological characteristics of the portions of the subarea adjacent to the main channel are similar to those in the River Channels Subarea.

There is little information about the other aquatic portions of the subarea. There is a tidal swamp south of Brooks Slough. Skamokawa Creek produces fall Chinook. Much of this subarea is within the home range of a bald eagle pair that nests near Clifton Channel and another pair that nests near Jim Crow Point.

##### 4.36.3. Shoreland Features

The shoreland in this subarea is low and bounded by steep topography around Skamokawa. This western portion is very scenic. Low areas have a high probability of flooding, and landslide topography occurs in the area west of Skamokawa. The land behind Skamokawa and is mostly diked tideland used for farming.

Vegetation includes pastureland grasses in the floodplain of Skamokawa Creek and steep forested slopes along the western part of the subarea.

Skamokawa Vista Park, has received large amounts of dredged material from the maintenance of the 40 foot navigation channel. The beach commonly erodes and is used as a beach nourishment disposal site. The banks of Skamokawa Creek at its entrance are former disposal sites.



The eastern portion of this subarea provides critical habitat for the Columbian white-tailed deer. Bear, black-tailed deer, and other upland species occur in addition to muskrat, nutria, and migratory waterfowl.

#### 4.36.4. Human Use

Human use is concentrated most heavily around the small community of Skamokawa. Skamokawa is located at the confluence of Skamokawa Creek and Brooks Slough.

There are a number of houses along the sloughs, along the north side of State Highway 4, and on the tip of the peninsula formed by Brooks and Steamboat Sloughs. There are a few small businesses and some waterfront net drying racks at the junction of Brooks Slough and Skamokawa Creek. On the west bank of Skamokawa Creek are a few houses and a rock pit. Many of the houses along Brooks Slough and Skamokawa Creek have floats or boat houses attached. Both water bodies allow passage of very shallow draft vessels. Low bridges and shallow depths limit passage of larger vessels. Land between Skamokawa Creek Bridge and Dead Slough is in residential use.

Wahkiakum Port District #2 has developed Skamokawa Vista Park on the west side of the mouth of Skamokawa Creek. The park receives intensive use for swimming, fishing, picnicking, camping, and boating. The Port is pursuing expansion to the west, primarily for increasing its campsite capacity. A non-profit community organization known as Friends of Skamokawa is working in association with the Port to develop public and visitor-oriented improvements in Skamokawa. Planned improvements include development of a walking path and foot bridge along Skamokawa Creek, acquisition and redevelopment of the historic Redmen Hall as a multi-use facility, and development of a public waterfront area to be named "Skamokawa Commons." The planned developments are described in the Skamokawa Tourism Facilities Preliminary Feasibility Study.

Lands between the Park and Three Tree Point are in both private and corporate ownership. This is a steep, scenic, and uninhabited area with poor public access. Parts of it are in commercial timber production. The tip of Three Tree Point is owned by the Federal Government.

The Corps of Engineers has three authorized projects in this subarea. One is the Columbia River navigation channel. Another was authorized in 1919 for a channel 6.5 feet deep, and 75 feet wide from the mouth of Skamokawa Creek to Skamokawa. This project extends up Skamokawa Creek approximately to the State Highway 4 bridge, and up Brooks Slough approximately to the Brooks Slough Bridge. Until 1974, the common method of maintaining this channel was by pipeline dredge with disposal along both banks of the creek. The current and probable future method of maintenance dredging is by propwash agitation. The third project was authorized in 1930 but has never been carried out. It provides for a channel 24 feet deep, 150 feet wide, and 2,640 feet long

in Steamboat Slough. A 250-foot square by 24-foot deep turning basin was the upstream limit of the project at mile 0.5, Winters Wharf. As of 1987, the Corps of Engineers had no plans to carry out this dredging project.

There are commercial gillnet drifts all along the Columbia River in this subarea.

#### 4.36.5. Issues

Visitors to Skamokawa Vista Park will need increased public services and lodging. There is currently some private housing in this area. Skamokawa will probably experience slight growth. The rural area behind Skamokawa is low and diked, and is poorly suited for more intense development.

Skamokawa Creek and Brooks Slough near Skamokawa are classified Development because there is extensive navigational use, and some housing and small businesses along these water bodies. State and Federal resource agencies have expressed concern over this designation for the mouths and lower reaches of salmon spawning streams.

The West Fork of Skamokawa Creek and Skamokawa Creek from Dead Slough north are classified Conservation to help protect existing salmon runs. With proper watershed practices and good water quality, these streams have salmon production potential.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of Engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be consulted concerning timing and location of in-water activity.

#### 4.36.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development:

1. The Main Navigation Channel plus a flowlane disposal area on both sides (either 600 feet wide or to the 20-foot bathymetric contour, whichever is narrower);
2. Skamokawa Creek downstream from Dead Slough; and
3. Brooks Slough.

The following aquatic areas are designated Rural:

1. Skamokawa Creek upstream from Dead Slough; and
2. The West Fork of Skamokawa Creek.

Remaining aquatic areas are designated Conservation.

The following shorelands are designated Rural:

1. Shorelands above Dead Slough.

The following shorelands are designated Conservation:

1. Shorelands between Three Tree Point and the section line between Section 7 of T9N R6W; and Section 12 of T9N R7W.
2. Shorelands on Price Island.

Remaining shorelands are designated Development.

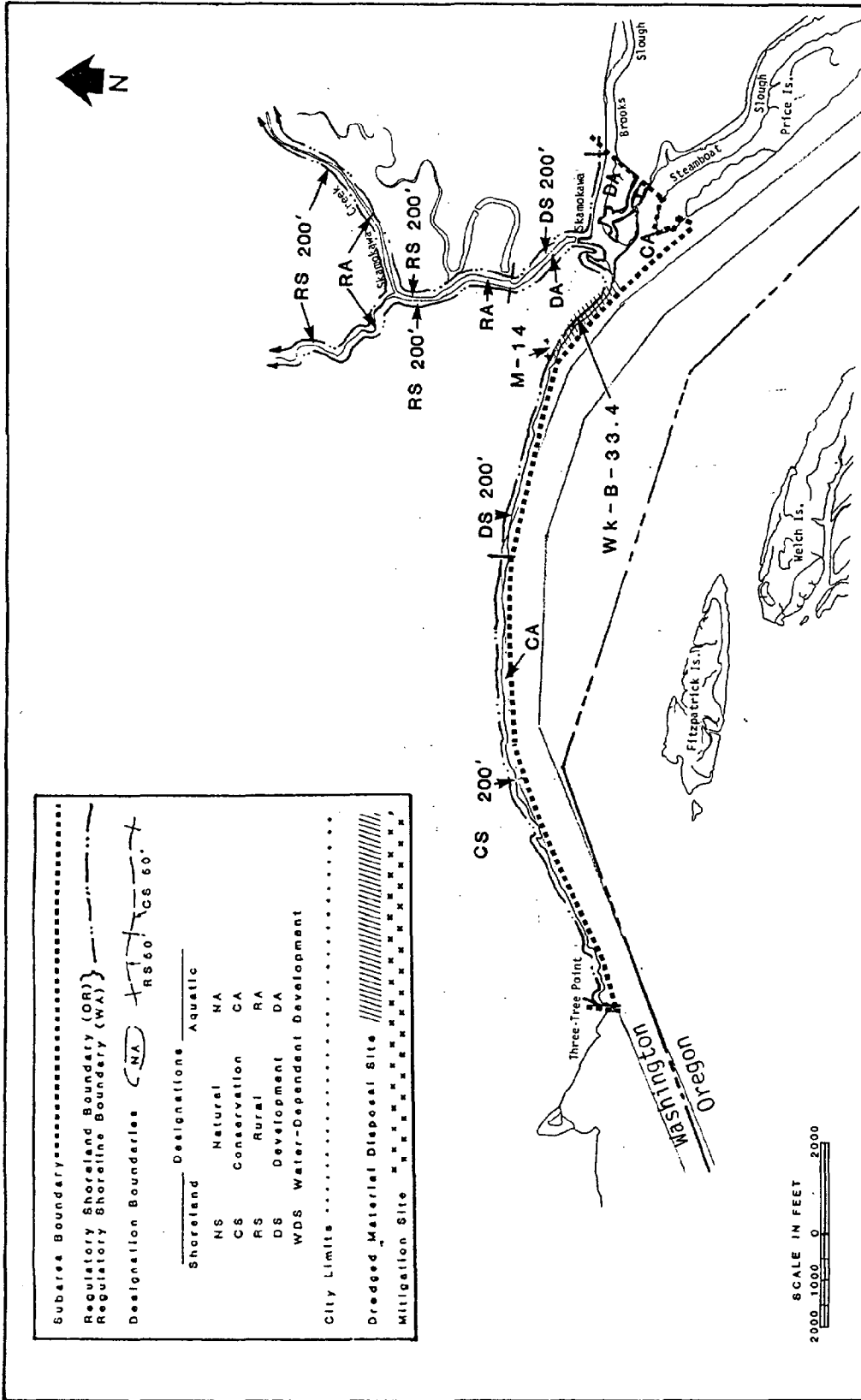
One Dredged Material Disposal site is listed in the 1986 Columbia River Estuary Dredged Material Management Plan for this subarea: Wk-B-33.4. The site is designated for material from Skamokawa Creek and Skamokawa Bar, but it can be used for other projects.

A 1.5-acre mitigation site is designated in Skamokawa Vista Park in the 1987 Columbia River Estuary Mitigation and Restoration Plan.

The regulatory shoreline boundary in this subarea is 200 feet from the Columbia River shoreline, the Skamokawa Creek shoreline, the Brooks Slough shoreline, the Steamboat Slough shoreline, and the West Fork of Skamokawa Creek shoreline.

#### 4.36.7. Subarea Policies

1. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.
2. In-water activities that may leave snags in gillnet drifts shall avoid drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.
3. The mitigation site in this subarea can be used as mitigation only for projects that provide direct economic benefits to Wahkiakum County.



Subarea Boundary	.....																		
Regulatory Shoreland Boundary (OR)	-----																		
Regulatory Shoreline Boundary (WA)	-----																		
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City Limits	.....																		
Dredged Material Disposal Site																			
Mitigation Site	xxxxxx																		

4.36. Skamokawa to Three Tree Point

#### 4.37. THREE TREE POINT TO HARRINGTON POINT

##### 4.37.1. General Description

This subarea includes the Brookfield log handling facility, the communities of Pillar Rock and Altoona, and aquatic and shoreland between Three Tree Point and Harrington Point. Aquatic areas between the shoreline and the State line are included. The subarea is under the jurisdiction of Wahkiakum County.

##### 4.37.2. Aquatic Features

The aquatic portions of this subarea include the Columbia River out to the 20-foot contour and small tidal marshes and swamps west of Three Tree Point and adjacent to Jim Crow Creek.

The aquatic physical and biological characteristics are similar to those in the adjacent channel (see Estuary Channels and River Channels Subarea Plans). The nearshore areas are migration routes for subyearling fall Chinook salmon. Two bald eagle pairs feed along the shoreline and in the adjacent water areas.

##### 4.37.3. Shoreland Features

The shoreline topography is generally steep and unsuitable for most activities other than timber production and private residences. Tideland soils occur only in the Brookfield area around the mouth of Jim Crow Creek. This area is largely in timber production.

Wildlife in this area is largely upland species such as deer, bear and upland birds. Two bald eagle pairs nest in the subarea: one near Jim Crow Point and one near Altoona.

##### 4.37.4. Human Use

Much of this land has a steep scenic topography, is remote and sparsely populated, and is used for commercial timber production. There are old cannery buildings at Pillar Rock and Altoona now used by commercial fishermen for storage.

Most of the area is used for waterborne commerce, timber production or rural residences. This area is sparsely populated; most people live at Pillar Rock, Altoona or between Pillar Rock and Elliott Point. Lands adjacent to the planning area are mostly in timber production. Within the planning area, ownership is mostly corporate and individual. The shoreline from Three Tree Point to Brookfield, and Jim Crow Point to

Pillar Rock is inaccessible by road. Brookfield is accessible via a logging road. Public road access ends at Pillar Rock.

Few industrial sites in this subarea are actively used. There is a log handling facility west of the mouth of Jim Crow Creek. There once were major salmon canneries at Pillar Rock and Altoona, but they have been closed for many years. The cannery sites now are used for boat moorage, net drying racks, and equipment storage. Aquatic uses include commercial gillnet fishing and sturgeon fishing.

#### 4.37.5. Issues

The potential for development in this area is limited by poor access, limited public facilities, and landslide topography. Brookfield, with deep water access, road access, and backup land, has some potential for industrial development. The fish-producing capacity of Jim Crow Creek could be improved. Altoona has been discussed as a possible port site because of its access to deep water, but the road system connecting Altoona with markets to the north and east is poor. A new road connecting Grays River with Pe Ell may be necessary before this port development could occur. The tourist potential in this area is untapped.

Gillnet fishermen have expressed concern over in-water activities which interfere with commercial fishing. Major areas of conflict include:

- Sinker logs from log rafts;
- Debris uncovered by dredging; and
- Dredged material disposal.

Potential conflicts may be alleviated through continued coordination between gillnetters, log transport companies and the Corps of Engineers. Some gillnetters have suggested that they be reimbursed for costs they incur while clearing drift areas. Such a requirement is outside of this Plan's scope. Planning measures that can be implemented to reduce the snag problem include:

- Requirements that conflicting activities avoid gillnet drifts whenever possible; and
- Requirements that gillnet drift captains be consulted concerning timing and location of in-water activity.

Although Wahkiakum County is generally adequately served by existing boat ramps, a potential boat ramp site exists near Altoona. The impact of new boat ramps on adjacent property is a concern in this subarea.

#### 4.37.6. Aquatic and Shoreland Designations

The aquatic area adjacent to the Development shoreland around the mouth of Jim Crow Creek is designated Development out to the 20 foot contour. Remaining aquatic portions of this subarea are designated Conservation.

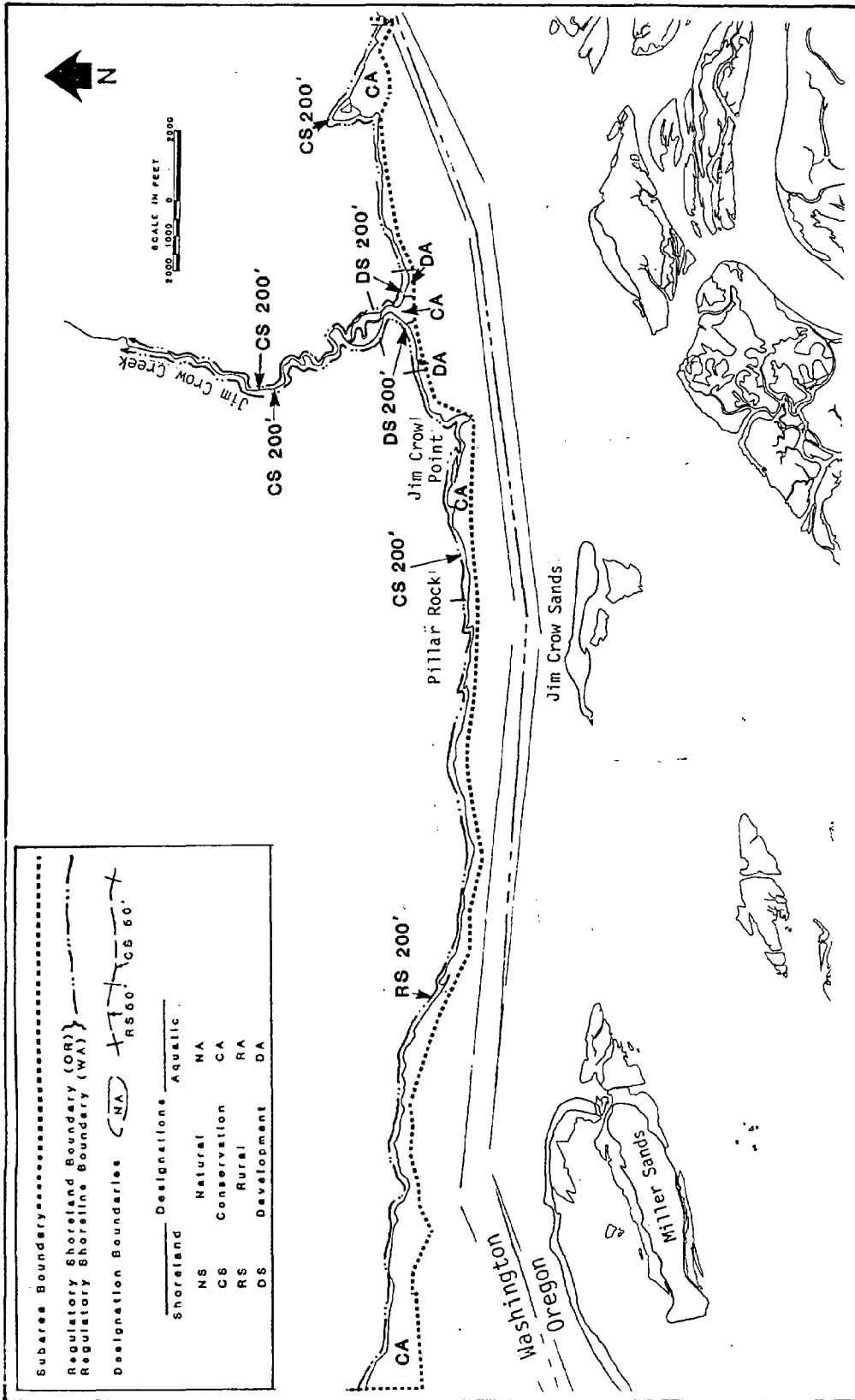
The shoreland from east of Pillar Rock to Harrington Point is designated Rural. The shoreland from the eastern boundary of the abandoned rock pit upriver from Brookfield to the western boundary of Brookfield is designated Development. The remaining shoreland in this subarea is designated Conservation.

The regulatory shoreline boundary is 200 feet inland from MHHW along the Columbia River shoreline and the Jim Crow Creek shoreline.

#### 4.37.7. Subarea Policies

1. Prior to approval of in-water activities with the potential for affecting fisheries, the project sponsor shall notify local drift captains, the Columbia River Fisherman's Protective Union and the Northwest Gillnetters Association. The Washington Department of Fisheries shall also be consulted to determine project timing and methods that will minimize impacts on the fishery.
2. In-water activities that may leave snags in gillnet drifts shall avoid drifts whenever possible. If a drift cannot be avoided, the project sponsor shall notify the drift captain.





4.37. Three Tree Point to Harrington Point

#### 4.38. GRAYS BAY AND TRIBUTARIES

##### 4.38.1. General Description

This subarea extends from the state line through Grays Bay and up Grays and Deep Rivers and Eden Valley to the extent of tideland soil, including the community of Deep River and part of the Campbell Creek Valley. In the Grays River valley, the area goes to about halfway between the communities of Rosburg and Grays River, and partially up the Seal River valley north of State Highway 4. The low lying lands in Eden Valley are also included to a point approximately one and one-half miles upstream from the mouth of Crooked Creek. The entire subarea is under the jurisdiction of Wahkiakum County.

##### 4.38.2. Aquatic Features

Aquatic portions of this subarea include Grays Bay waters and wetlands, Deep River, Grays River, and other tributaries. The primary alterations to the subarea over the last century have resulted from diking activities in the bay's tributaries. Large areas of tidal swamp have been diked and converted to farmland along Deep and Grays Rivers, and Eden Valley.

Because Grays Bay contains large tidal flats and many small channels, water circulation patterns are complex. Numerical models have provided insight into the factors influencing circulation in Grays Bay. Much of the tidal flow into and out of the bay occurs through the channel along Portuguese and Rocky Points. Wind conditions are important factors determining the bay's circulation. Strong north winds significantly lower the bay's water levels. In addition, tidally-averaged currents which normally flow to the north on the eastern end of the bay change direction and flow to the south under these conditions. During strong south winds the bay's water level raises and the tidally-averaged north flowing currents become stronger. Although some of the factors influencing circulation within the bay have been studied, the circulatory patterns and current velocities have not been fully characterized.

The Grays Bay Subarea is predominantly a freshwater environment but exhibits some saline water intrusion during low river discharge. During low river discharge the flood tide salinity of the bay ranges from 0.5 to 5 ppt and the salinity of the deep channel near Portuguese Point can exceed 15 ppt.

The sediments of the Grays Bay Subarea have mean grain sizes ranging from coarse and medium sand in the channels on the west side of the bay to very fine sand, silt, and clay over much of the remainder of the subarea.

The plant types of the Grays Bay Subarea include phytoplankton, benthic algae, submergent vascular plants, and tidal marsh and swamp vegetation. Phytoplankton productivity is low compared with adjacent subarea. Benthic algal productivity is highest on the east shore tidal flats of Grays Bay and lowest on the central Grays Bay shoals. The overall productivity range of the subarea's benthic algae falls between the high values measured in Youngs and Baker Bays and the low values of the central estuary. Several freshwater submergent vascular plants occur in the bay. Sparse growths of pondweeds (Potamogeton richardsonii and P. foliosus) appear on the tidal flats in spring and summer and hornwort (Ceratophyllum demersum) and waterweed (Elodea canadensis) are often abundant in small pools within the low marshes. In addition, the benthic macroalga Enteromorpha intestinales var. maxima occurs in Grays Bay. Grays Bay tidal marshes and swamps contain a wide variety of plant species. Colonizing low marshes dominated by bulrush (Scirpus validus) account for about 60% of the low marsh area. These marshes grow along the shoreline and form several small marsh islands. Shrub and tree species dominate the swamps of the subarea. Many of the swamps grade into similar upland vegetation types.

The invertebrate types studied in Grays Bay include benthic infauna and epibenthic organisms. Important fish prey organisms such as amphipods (Corophium salmonis) marine worms (Neanthes limnicola), clams (Corbicula manilensis), and insect larvae (chironomids) dominate the benthic infauna community. Although total infauna biomass falls below levels measured in Youngs and Baker Bays, it exceeds biomass levels found in many other parts of the estuary. The epibenthic zooplankton community on the tidal flats of the bay exists in low densities during the high river discharge periods and very high densities during the low river discharge period. Sand shrimp are abundant during the low river discharge period.

Fish utilization of Grays Bay has not been well characterized. The fish community has only been sampled with bottom trawls; therefore, mid-water species and species favoring intertidal habitats have not been well represented in past studies. Most of the fish found in the bay are either freshwater species or marine species tolerant of freshwater. Two marine species, starry flounder and Pacific staghorn sculpin, utilize the bay year round. Juvenile starry flounder are particularly abundant in the bay. The freshwater species threespine stickleback, peamouth, and prickly sculpin are also abundant in the bay. Longfin smelt, an anadromous species which spawns in the estuary from November through March, may spawn in the Grays Bay subarea. Smelt ranging in age from yearlings through adults are very abundant in the western portion of the subarea in summer and fall. Larval longfin smelt appear in the estuary in winter and spring and subyearlings utilize the subarea as a nursery area in summer and fall.

In addition to longfin smelt, several other anadromous species, including American shad, eulachon, and the salmonids, migrate through the bay and use the bay as a nursery area. Adult American shad migrate upriver in June and July. Most of the upstream migrants are destined for spawning areas upriver from the estuary and do not pass through

Grays Bay. Some adult shad, however, migrate through the bay to spawn in Grays and Deep Rivers. Juvenile American shad migrate downriver primarily in November and December. Juvenile shad, originating from upstream spawning areas as well as Grays and Deep Rivers use the bay as a nursery area. Eulachon migrate upriver from December through April with a peak run in February. Although the main run of eulachon destined for upriver spawning areas does not utilize Grays Bay, a small run migrates through the bay to spawn in Grays River. Several salmonid species utilize the bay as a migration route or nursery area. Sub-yearling Chinook salmon utilize the bay in spring and summer. These juvenile Chinook include populations which have migrated from upriver as well as from natural spawning areas and a hatchery on Grays River. Yearling Chinook and coho and juvenile steelhead migrate through the bay primarily in spring. The yearling Chinook populations are from upriver stocks, while the coho and steelhead populations originate both upriver and in natural spawning areas in Grays River. Coho are also produced in the hatchery on Grays River.

The Grays Bay Subarea provides habitat for several species of migratory and resident birds. Two resident waterfowl, common merganser and mallard, are particularly abundant in Grays Bay. The western grebe, a migratory species, utilizes the bay in spring, fall, and winter. They are very abundant when these birds gather in Grays Bay and adjacent subareas prior to their spring migration. Other migratory species that winter in the bay or use it as a migration resting point include swans, canvasbacks, pintails, wigeons, and green-winged teals. Gulls utilize the bay year round and shorebirds become concentrated on the tidal flats and low marshes in winter. Three separate nesting pairs of eagles utilize the bay. Two nests are on Rocky Point and one near Altoona. In addition, the bay is used by wintering and transient eagles.

Marine mammal utilization of the subarea is low compared with other regions of the estuary. Harbor seals have been observed feeding in the bay in spring, fall, and winter.

Aquatic and terrestrial mammals utilize the extensive marshes and swamps of the Grays Bay Subarea. Muskrat and nutria feed and den in both the marshes and swamps. Muskrat concentrate in the bulrush low marshes while nutria utilize mainly the low and high marshes. Beaver and raccoon feed and den in the subarea's swamps. River otter primarily utilize the swamps and have been sighted in Grays and Deep Rivers. Deer periodically feed in the subarea's swamps.

#### 4.38.3. Shoreland Features

The most prevalent soil type in this subarea is a silty clay loam, which is a very deep, poorly drained soil with a very slow permeability rate. All of the lands in this subarea are within the 100-year floodplain. Flooding occurs nearly every winter which is particularly serious in the lower valleys. Heavy rains coinciding with storm tides and high winds cause dike breaching, road washouts, and flooding of farms and buildings, presenting a considerable hazard to lowland resi-

dents. The flooding is thought to be worsened and made more frequent by the shallow, debris filled channel of Grays River. At the mouth, a bar develops which acts as a dam behind which flood waters deepen and overtop the dikes.

Shoreland vegetation is largely agricultural, but there are forested areas. The agricultural lands are generally diked tidelands. The shorelands provide wildlife habitat for migrating waterfowl, black-tailed deer, elk, bear, and smaller furbearers such as muskrat and nutria. Pigeon Bluff, on the east shore of Grays Bay, is very important habitat for wild band-tailed pigeons because of mineral-rich water there.

#### 4.38.4. Human Use

This subarea is mostly agricultural (hay and dairying), with the wetlands used for recreational hunting. Parts of Grays River and Grays Bay are used for commercial and sport salmon fishing and some sturgeon fishing. The adjacent uplands on the east and west side of Grays Bay and up Deep River are mostly in timber production. Road access is from State Highway 4. Public services are available at the unincorporated communities of Grays River, Rosburg, and Deep River.

Industry is limited to small logging companies, custom sawmills, and the large Weyerhaeuser sorting yard and associated log handling equipment along Deep River. There is extensive in-water log storage in Deep River. Log rafting and sorting areas, a truck repair yard, and log haul road lie immediately adjacent to the community of Deep River. Both the river and the community are historically associated with the timber industry.

There is a Department of Wildlife boat ramp at the Rosburg Bridge on Grays River. There are two structures on the National Register of Historic Places: The Grays River Covered Bridge, and the Deep River Pioneer Lutheran Church.

#### 4.38.5. Issues

Agricultural and low-lying forest areas will probably remain in those uses, perhaps with some increasing residential use. Industrial development will most likely be related to wood products in the Deep River area. The Weyerhaeuser sorting yard may expand north and east; small operations may expand farther downstream along Deep River; log handling and storage operations may expand around the community of Deep River.

Certain forest practices, such as the construction of logging roads, clear-cutting, and clearing of riparian vegetation, result in significant increases in sediment loads to streams, deterioration of spawning habitat ("choking" of spawning gravels) and increases in

turbidity and water temperatures. The Washington Shoreline Management Act specifies that local jurisdictions shall allow a maximum of thirty percent of merchantable timber to be cut in any ten-year period for those areas within 200 feet landward of the ordinary high water mark on shorelands of statewide significance. Local governments have regulatory discretion on timber harvesting methods within designated shorelands. There is a need to ensure compliance with Shoreline Management Act and Forest Practices Act standards as well as to tailor timbering practices to topography, drainage patterns and fisheries habitat values.

The Washington Department of Natural Resources has leased large state-owned portions of Grays Bay for oil and gas exploration. There are similar leases for the rest of the shoreline east to Puget Island, and west to the mouth of the Columbia River.

For most of the shorelands in this subarea, the current (and logical future) use is agriculture. The forested area on the west side of the mouth of Grays River is very low and undiked and may be suitable for agricultural use only after extensive modification.

Those areas along Deep River designated as Development include existing industrial sites, areas where new facilities are currently being constructed, areas for expansion of existing industrial facilities, and a few homes. Wahkiakum County amended its Shoreline Master Program designations in 1985 for portions of the shoreland and aquatic areas in Deep River to Urban to facilitate water-dependent industrial development of a site with good water and road access. The community of Deep River and the adjoining log handling facility have a history of intensive use. Some of the land west of the main line road is leased for agriculture but represents a possible industrial expansion site. The triangular piece of land across from the community of Deep River also has the potential for industrial expansion.

The Deep River development site may contain nontidal wetlands under Federal Section 404 jurisdiction. Wetland losses associated with development of this site may require mitigation.

A significant aspect of the plan in this subarea is the recognition of the natural resource value of the tideflats and tidal marshes in Grays Bay and the protection provided.

Although Wahkiakum County is, in general, adequately served by existing boat ramps, a potential new boat ramp site exists at the community of Deep River. The impact of new boat ramps on existing adjacent properties is a concern in this subarea.

#### 4.38.6. Aquatic and Shoreland Designations

The following aquatic areas are designated Development: the authorized Deep River channel between Rocky Point and Deep River; the proposed channel for Grays River between the Rosburg Bridge and its

junction with the Deep River channel; the waters of Deep River between the community and the triangular shoreland parcel across from the town; and the water between the channel and the Development shoreland.

Hitchcock Creek and Crooked Creek are designated Conservation, as is Campbell Creek downstream to its junction with Lassila Creek.

The subtidal portions of Grays Bay are designated Conservation, except for the designated Deep River Channel (Development), and shallow intertidal areas (Natural). A 100-foot wide conservation band surrounds most of the Bay between the shore and the Natural designation.

The following shoreland areas are classified Rural: the shorelands of Hitchcock Creek; the shorelands of Eden Valley; the shorelands of Grays River Valley except on the west bank at the mouth; the shorelands on the west bank of Grays Bay and Deep River up to the log handling facility on the downstream edge of Deep River; the shorelands from Miller Point up the east bank of Deep River approximately 3/4 of a mile; the shorelands between the Weyerhaeuser sorting yard and the State Highway 4-Deep River Bridge to the community of Deep River, except as otherwise noted; and the shorelands from the community of Deep River along both forks of Deep River to the planning boundary, except as otherwise noted.

The following shoreland areas are classified Development: the community of Deep River and adjoining log handling facility, a triangular shoreland parcel across from the community of Deep River; the shoreland north of the community of Deep River along the Crown Zellerbach main line log road and west to the planning boundary; and the shoreland along the east bank of Deep River from a point approximately 3/4 of a mile from Millers Point upstream to where the unnamed slough turns east on the Weyerhaeuser property between the sorting yard and the State Highway 4-Deep River Bridge.

Remaining shorelands are designated Conservation.

A mitigation site on Deep River is identified in the 1987 Columbia River Estuary Restoration and Mitigation Plan.

The following dredged material disposal sites are identified in the 1986 Columbia River Estuary Dredged Material Management Plan for this subarea: Wk-S-20.7, Wk-S-21.1, Wk-S-22.9, Wk-S-22.4.

The regulatory shoreline boundary is 200 feet landward of MHHW along Deep River, Grays River, Crooked Creek, Hitchcock Creek, Sisson Creek and Seal Slough.

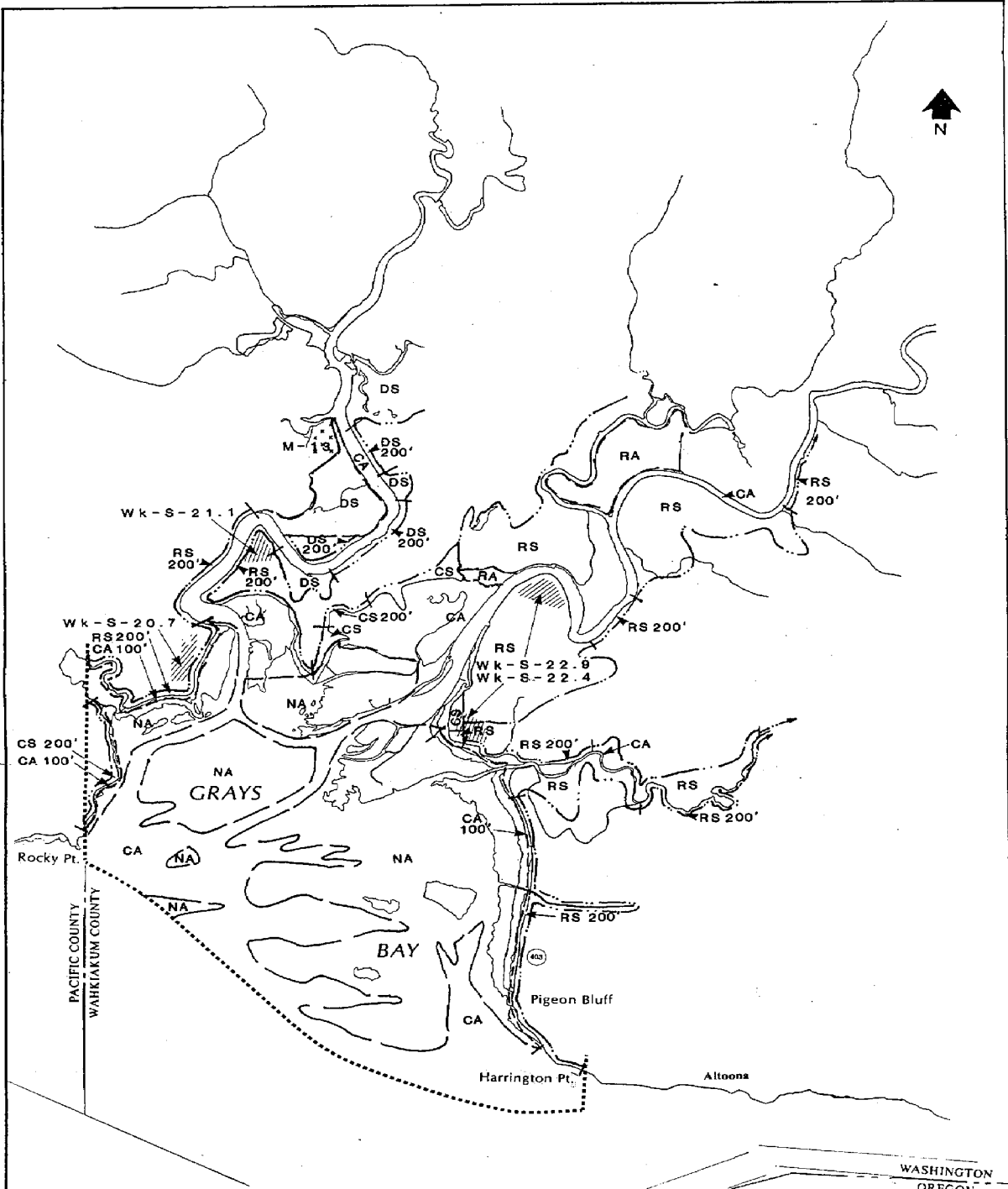
#### 4.38.7. Subarea Policies

1. Notwithstanding the Natural and Conservation designations in Grays Bay, the construction of a channel or channels for flood control

and navigational access in the bay shall be permitted as agreed to by Wahkiakum County and the U. S. Army Corps of Engineers.

2. The mitigation site in this subarea can be used as mitigation only for projects that provide direct economic benefits to Wahkiakum County.





Subarea Boundary: - - - - -

Regulatory Shoreland Boundary (OR): - - - - -

Regulatory Shoreline Boundary (WA): - - - - -

Designation Boundaries: (NA) RS 60' CA 50'

Shoreland Designations		Aquatic
NS	Natural	NA
CS	Conservation	CA
RS	Rural	RA
DS	Development	DA
WDS Water-Dependent Development		

Dredged Material Disposal Site: [Hatched Pattern]

Mitigation Site: [Dotted Pattern]

SCALE IN FEET  
2000 1000 0 2000

#### 4.39. KNApptON/FRANKFORT

##### 4.39.1. General Description

This subarea includes shoreland and aquatic areas between the Astoria-Megler Bridge and the Pacific-Wahkiakum County line. It extends waterward to the 20-foot bathymetric contour. The subarea is under the jurisdiction of Pacific County.

##### 4.39.2. Aquatic Features

Aquatic portions of this subarea include open water habitat adjacent to the north channel and tidal flats and small fringing marshes in the subarea's small embayments.

Aquatic physical and biological characteristics of the open water areas are similar to those in the adjacent channel (see Estuary Channels Subarea Plan).

The subarea's small embayments are fringed by narrow marshes and broad tidal flats. Some of the marshes and flats have been separated from the estuary by the highway. They are culverted to provide tidal exchange. The vegetation in the subarea's marshes consists primarily of bulrush (Scirpus validus) and Lyngby's sedge (Carex lyngbyei). The tidal flats are rich in food prey organisms such as amphipods (Corophium salmonis). The shallow nearshore areas are migration routes for juvenile salmonids, particularly subyearling fall Chinook salmon. Four nesting pairs of bald eagles feed in the subarea. Their nests are near Rocky Point, Grays Point, Cliff Point, and Megler.

##### 4.39.3. Shoreland Features

Soils in this subarea are generally silt loams, subject to slippage and erosion due to steep slopes. There are limited Nuby soils and filled lands that are subject to flooding. Shorelands are mostly forested down to the shoreline. Elk, deer, bear, and bald eagles are relatively common in this area.

##### 4.39.4. Human Use

Existing land and water uses include rural residential, commercial and sport fishing, pleasure boating, and forest management. Adjacent upland land use is forest management with small rural areas. There is a small undeveloped boat ramp near Knappton.

Shoreland ownership is mostly by timber companies with some private and state holdings. Tidelands are in state ownership. State Highway 401 follows the shoreline between the Astoria-Megler Bridge and Knappton. A highway rest area is about one-half mile east of the bridge.

#### 4.39.5. Issues

There is little development pressure at this time. In the future, there could be increased demand for public access. As the recreational fishing industry recovers from the shortened fishing seasons of the early 1980's, the demand for new public boat ramps will probably increase. Although public boat ramps provide economic benefits to nearby communities, they sometimes also result in traffic and parking impacts and shoreline erosion from boat use.

Two areas that have potential for recreational access are identified in this subarea. One is an outcropping on the west end of Hungry Harbor. The other is the existing boat ramp at the old saw mill site at Knappton.

A shoreline trail between Knappton and Frankfort would provide low-intensity access to a long stretch of shoreline. Easements or outright purchase of private property would be needed for this project.

#### 4.39.6. Aquatic and Shoreland Designations

The aquatic portions of this subarea are designated as follows:

##### Natural

- Nearshore intertidal areas between Pacific/Wahkiakum County line and the section line between Sections 8 and 17, T9N R9W.
- Off-shore intertidal areas.

##### Conservation

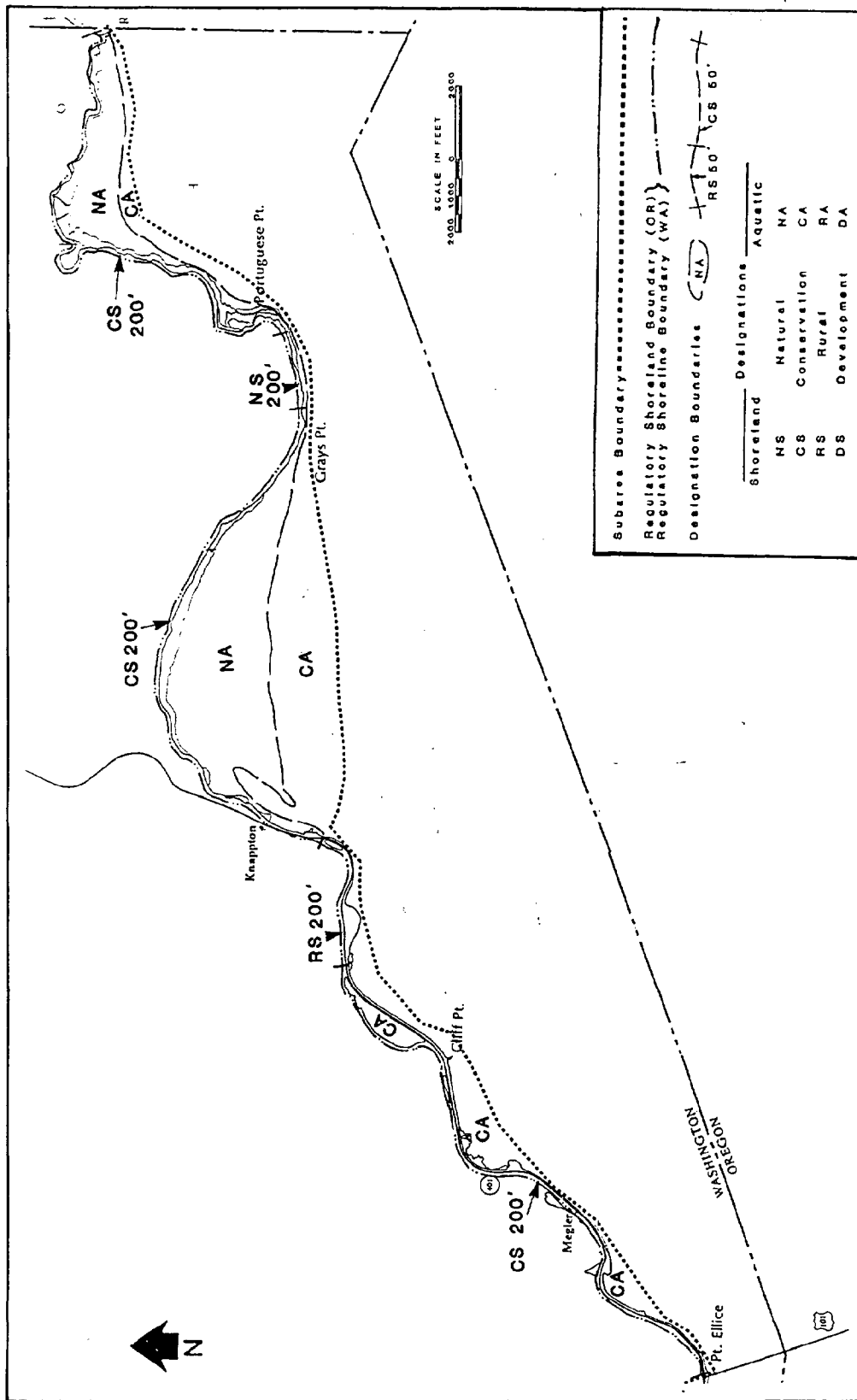
- Nearshore intertidal areas between the Astoria/Megler Bridge and the section line between Sections 8 and 17, T9N R9W.
- All other aquatic areas.

The shorelands are designated Conservation, except for a Rural designation for the area of residential development at Knappton ( in Section 17, T9N R9W), and a Natural designation for the state-owned lands from Portuguese Point to Frankfort (not including the old quarry).

The regulatory shoreline boundary is 200 feet from the Columbia River shoreline throughout this subarea.

#### 4.39.7. Subarea Policies

1. This subarea has potential for expanded public recreational access. The boat launching ramp at the old saw mill site at Knappton should be improved and maintained with adequate parking for cars and trailers.
2. The feasibility of developing a shoreline trail from Knappton to the old town of Frankfort should be investigated. This would provide low-intensity access to a long stretch of shoreline.



4.39. Knappton/Frankfort

#### 4.40. MCGOWAN

##### 4.40.1. General Description

This subarea includes shoreland and aquatic areas between the Astoria-Megler Bridge and Chinook Point. It extends waterward to the 20-foot bathymetric contour. Most of Fort Columbia State Park is included. The subarea is under the jurisdiction of Pacific County.

##### 4.40.2. Aquatic Features

Aquatic areas include shorefront beaches and water areas along the north channel of the Columbia River. The beach is composed of coarse, sandy sediments with gravel and larger rock.

Aquatic physical and biological characteristics are similar to those in the adjacent channel (see Estuary Channels Subarea Plan). There are small fringes of marsh vegetation along the more protected portions of the beach. Two nesting pairs of bald eagles feed in the subarea. Their nests are located near Megler and on Scarboro Hill.

##### 4.40.3. Shoreland Features

Shorelands include a narrow fringe of steep forested land and some flat land around McGowan. Soils in this subarea are generally silt loams or silty clay loams. Shoreland hazards include possible slides in steep areas and erosion of the river shoreline, which is ripped to retard erosion.

Wildlife values of the shorelands are moderate. The highway running along the shoreline creates a barrier between aquatic and upland areas. Deer, elk, bear, bald eagle, hawks, waterfowl, small mammals and other wildlife are relatively common in the area.

##### 4.40.4. Human Use

Highway 101 is the dominant developed feature in this subarea. Land and water uses include commercial and sport fishing, recreational boating, forest management, and shoreland recreation at Fort Columbia State Park.

Tidelands are nearly all in private ownership, except for state owned areas around Chinook Point. Shoreland ownership is private around McGowan and corporate in the forested areas. The beach in this area gets some recreational use at low tide for beachcombing and walking.

Fort Columbia State Park is a regionally-significant historical and recreational resource. Improvement of its facilities, consistent with maintaining the natural and scenic character, will enhance these values.

#### 4.40.5. Issues

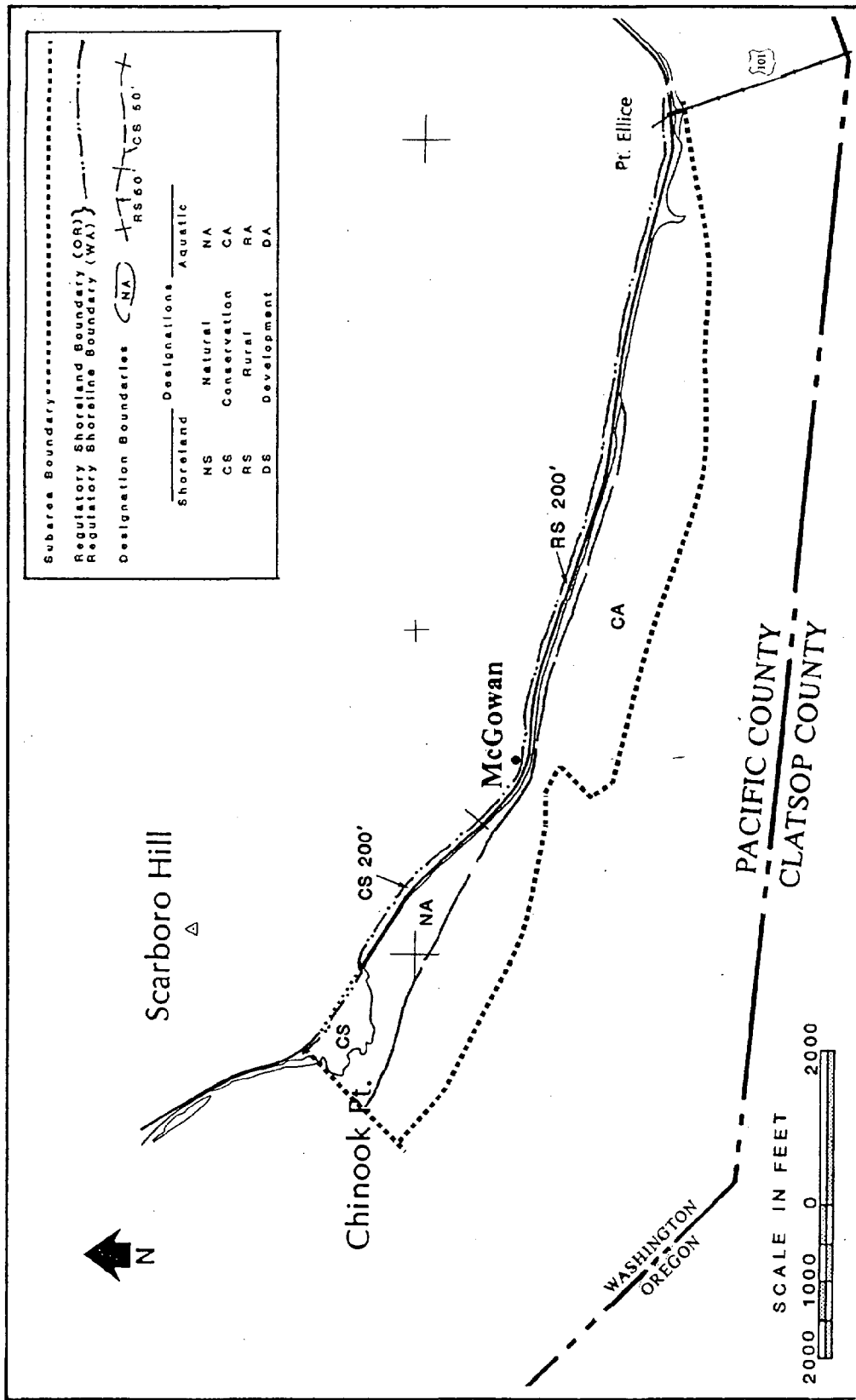
There is little development pressure or potential in this area. Very little buildable land exists, except around McGowan. Development constraints such as a high water table limit development there.

#### 4.40.6. Aquatic and Shoreland Designations

All aquatic portions of this subarea are designated Conservation, except nearshore intertidal areas between Chinook Point and the section line between Sections 22 and 23, T9N R8W, which are designated Natural.

The shoreland areas between McGowan and the Astoria-Megler Bridge are designated Rural. The remaining shorelands west of McGowan to Chinook Point are designated Conservation.

The regulatory shoreline boundary is 200 feet from the Columbia River shoreline throughout this subarea.



4.40. McGowan



#### 4.41. CHINOOK

##### 4.41.1. General Description

This subarea includes the unincorporated community of Chinook and adjacent aquatic areas of Baker Bay. A special district, the Port of Chinook, is included. The subarea is under the jurisdiction of Pacific County.

##### 4.41.2. Aquatic Features

Aquatic portions of this subarea include nearshore wetlands, the Chinook Boat Basin and part of Chinook Channel. Aquatic areas are extremely shallow except for the navigation channel and basin.

Aquatic physical and biological characteristics are similar to those described in the Baker Bay Subarea Plan.

##### 4.41.3. Shoreland Features

Soils in this subarea include the Westport and Yaquina associations, and filled land with low slope. The filled area is east of the boat basin and much of it is a stockpile site for dredged material disposal. Most of the shorelands are developed for residential and commercial uses.

Wildlife value of the shorelands is moderate inland from Chinook. Deer, beaver, and other small mammals inhabit the area.

##### 4.41.4. Human Use

The unincorporated community of Chinook and the Port of Chinook include residential, commercial, and industrial uses. Boat moorage, navigation, and dredged material disposal are associated with port operations. Tideland ownership is a mixture of private and state. Shoreland ownership is mostly private and the Port of Chinook. The Port of Chinook moorage facility is the third largest in the estuary, with a capacity of 323 vessels. The Port of Chinook also has a boat ramp.

##### 4.41.5. Issues

The Port of Chinook has significant potential for expansion. The The 200 mile Exclusive Economic Zone has stimulated additional demand for moorage of larger commercial fishing vessels. However, the "El

Nino" event and shortened fishing seasons in the early 1980's depressed the commercial and recreational fishing industries. The Port of Chinook is beginning to recover from this depressed period.

Severe shoaling problems throughout Baker Bay (see Baker Bay Subarea Plan) are threatening the navigation channel into the Port of Chinook. Dredging to maintain the channel has become increasingly expensive and more frequently necessary. Adequate disposal area for dredged material is a growing problem. The viability of the third largest mooring basin in the estuary is threatened.

Although the nature and extent of the navigational access problems in Baker Bay have received careful attention during the CREST planning process, the scientific research and engineering studies necessary to solve these problems are beyond the scope of this plan. Accordingly, this plan provides for the future resolution of these problems without determining the exact measures which may be necessary. Possible solutions to the navigation channel problems being considered include channel realignment and alteration of the bay's circulation to increase scouring in the channel.

The planning process included discussion of the appropriate areas for Port expansion. Expansion areas are allowed for both to the west and east of the basin.

The conversion of Chinook Park to overnight use has resulted in heavy use by tourists and complaints from local residents that they can no longer enjoy the park. There is a need for day-use facilities at the park.

#### 4.41.6. Aquatic and Shoreland Designations

The existing navigation channel is designated Development. In the event that a realignment of the channel is agreed to, the new channel is also designated Development by this plan. The present facilities and future expansion plans of the Port of Chinook are accommodated by a Development designation for the aquatic area between Olsen Street and Cherry Street, extending 500 feet out from the shoreline.

The remaining aquatic portions of the subarea are designated Natural where there are intertidal wetlands, and Conservation for subtidal aquatic areas.

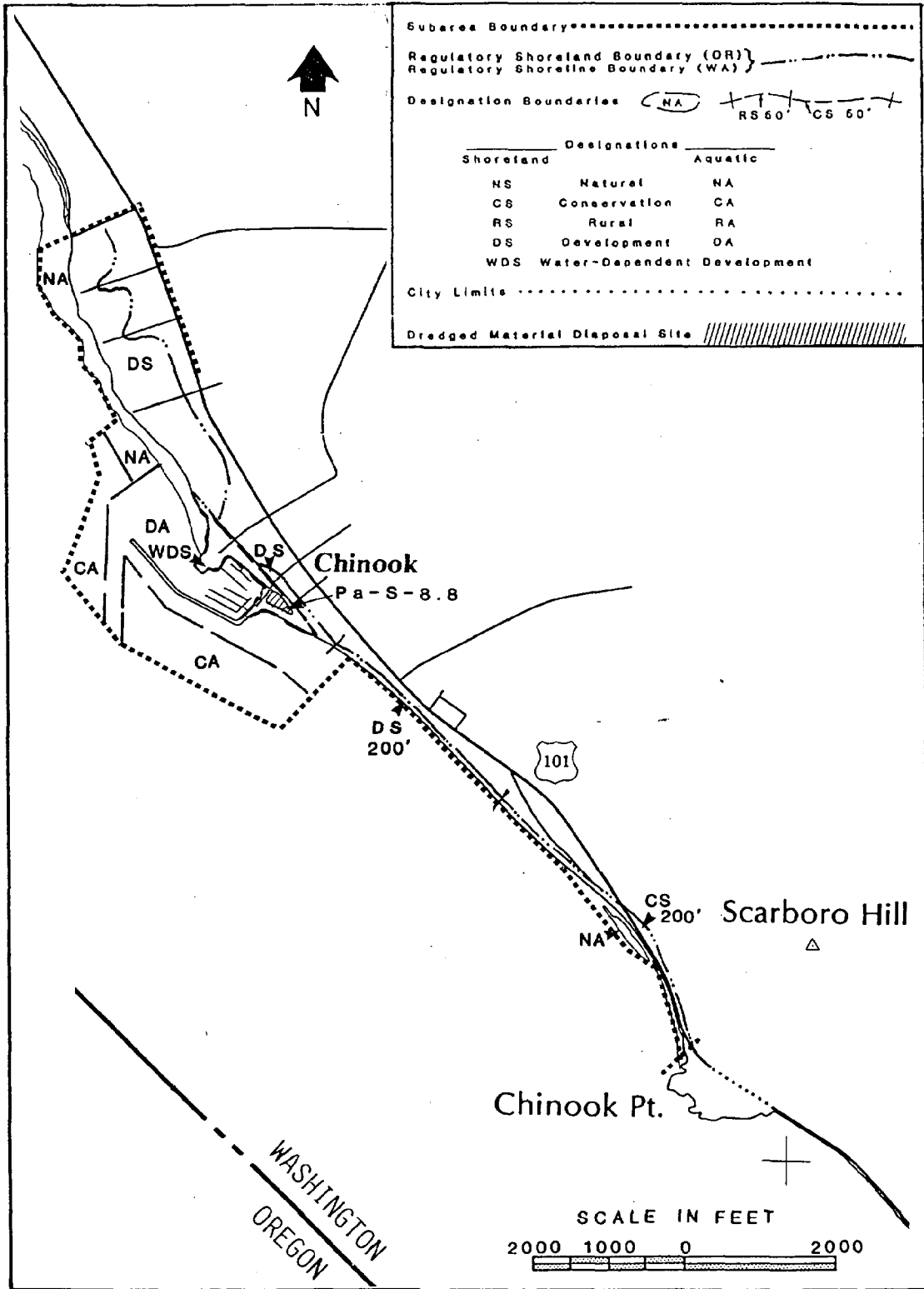
Shorelands east of Chinook Park are designated Conservation. West of Chinook Park the shorelands are designated Development. Shorelands between Olsen and Cherry Streets waterward of Water Street are designated Water-Dependent Development.

One dredged material disposal sites is listed and described in the 1986 Columbia River Estuary Dredged Material Management Plan for this subarea: Pa-S-8.8. This site is used in connection with dredging in the Chinook boat basin and the Chinook Channel.

The regulatory shoreline boundary is the 100-year floodplain, except between Chinook Point and the section line between Sections 16 and 21, T9N R8W, where it is 200 feet from the shoreline of the Columbia River.

#### 4.41.7. Subarea Policies

1. Expansion of the Port of Chinook and its entrance channel should be done in such a way as to minimize damage to aquatic productivity, maintain water quality and flushing, and avoid aggravating the shoaling problems of the bay.
2. The Development Aquatic area east of the present Port facilities should be designated and utilized as a dredged material disposal site.
3. Day-use-only facilities should be developed at Chinook Park so that both tourists and residents may enjoy the park. This may require some reduction in the size of existing camping facilities.
4. This plan recognizes and provides remedies for the navigational access problems in Baker Bay. The local governmental bodies, relevant agencies and interested parties shall continue to pursue the resolution of those problems. Approved channel realignments and/or improvements shall be permitted notwithstanding the designations of this plan.



4.41. Chinook

#### 4.42. CHINOOK RIVER

##### 4.42.1. General Description

This subarea covers most of the drainage basin of the Chinook River and includes the tideland soils, fringing marshes along Baker Bay, and the waters and wetlands of the river. The subarea is under the jurisdiction of Pacific County.

##### 4.42.2. Aquatic Features

Aquatic portions of this subarea include fringing tidal marshes and swamps along the shoreline and open water areas at the mouth of the Chinook River. This subarea has undergone substantial changes in the past century. The Chinook River floodplain was once a large tidal marsh and swamp partially separated from the bay by sand dunes. The Chinook River floodplain was diked and converted to agricultural land in the early 1900's. The fringing marshes of the subarea formed after jetty construction eliminated ocean wave action against the Bay's shoreline.

Aquatic physical and biological characteristics are similar to those described in the Baker Bay Subarea Plan. Bird and wildlife habitat is extensive in the tidal marsh and swamp area south of the Chinook River mouth. The subarea is a feeding area for a pair of bald eagles which nests on Scarboro Hill and for wintering and transitory eagles.

##### 4.42.3. Shoreland Features

Soils along Highway 101 are generally loamy fine sand. In the floodplain area silty clay loams are found. These are good agricultural soils. High erosion and flood potentials exist. The shorelands are mostly cleared of timber for agricultural use with limited forest acreage. Nontidal wetlands include the Chinook River, several associated sloughs, and some low wet areas of pasture. Wildlife values are high in much of the subarea.

##### 4.42.4. Human Use

Existing uses include agriculture, rural housing, recreation, and an industrial site at the mouth of the Chinook River. The facilities on this industrial site, which are connected with proposed mining of black sands, are presently unused. This area receives recreational usage by hunters and those who enjoy watching wildlife.

#### 4.42.5. Issues

There is presently little pressure for additional development in this area. The potential does exist, however, for industrial and residential development. Mineral leases exist below mean high tide on both public and private tidelands. The existing industrial area, although not currently used, may not be compatible with adjacent trailer parks and rural housing.

The peninsula at the mouth of the Chinook River between Highway 101 and Baker Bay has potential as a possible park or waterfront access point. This location would offer both visual and physical access to Baker Bay and the large wetland area directly adjacent.

Siltation of the Chinook River has reduced historical runs of anadromous fish that use this river. A 1963 study by the Soil Conservation Service recommended dredging the river to improve drainage. Such dredging would also enhance fisheries in the river, particularly for salmon returning to the Sea Resources Hatchery.

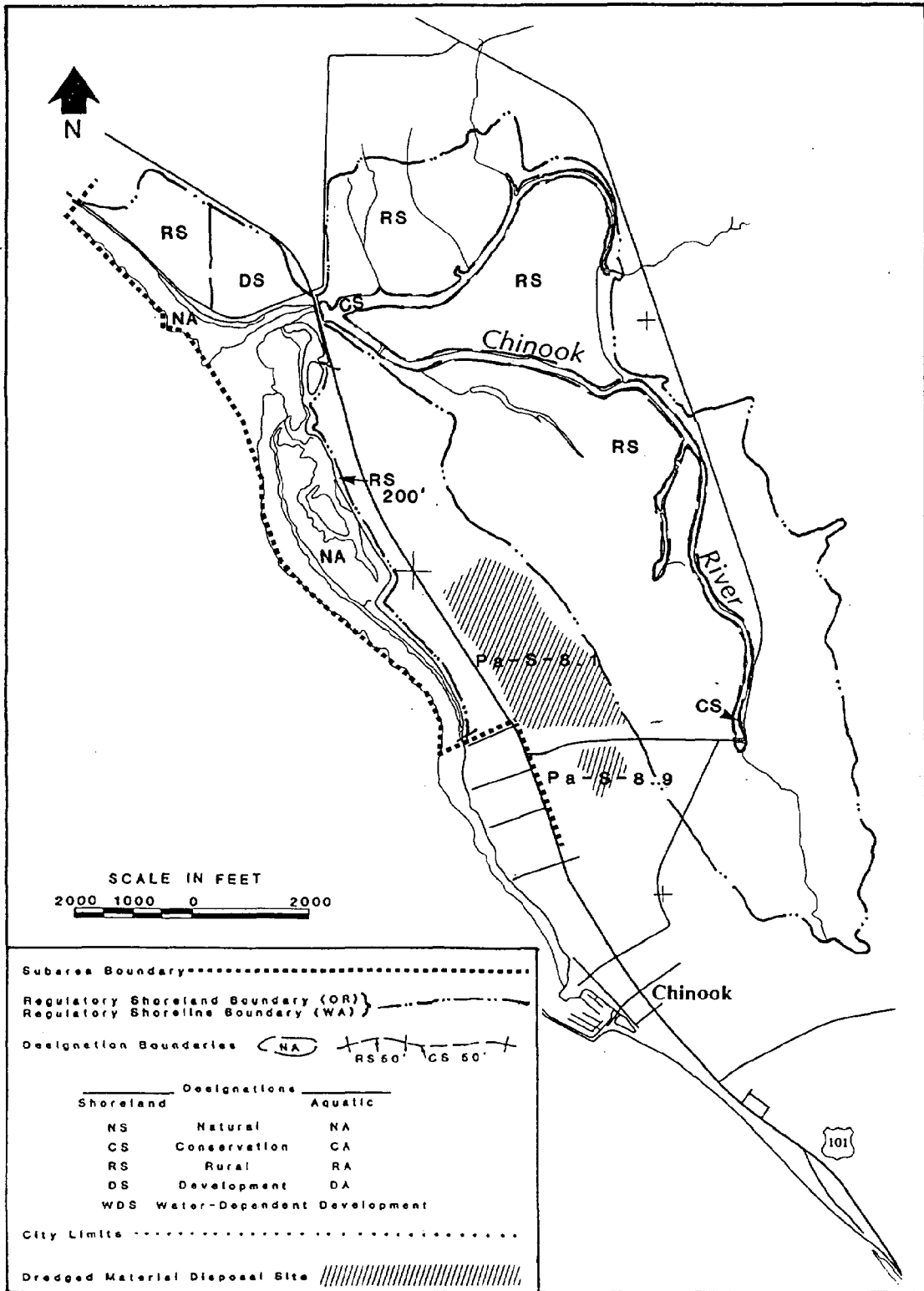
#### 4.42.6. Aquatic and Shoreland Designations

The state-owned wetlands and the remaining aquatic areas of the Chinook River are designated Conservation. The fringing marshes along Baker Bay to the 3-foot bathymetric contour are designated Natural. Aquatic areas deeper than 3 feet below MLLW are designated Conservation.

Privately-owned nontidal freshwater wetlands east of Chinook are designated Rural. The privately-owned areas of tideland soils used for agriculture to the east of Highway 101 are designated Rural. The state-owned land east of Highway 101 is designated Conservation. West of Highway 101, the shorelands are Rural, except for the existing industrial site which is designated Development.

There are two dredged material disposal sites listed in the 1986 Columbia River Estuary Dredged Material Management Plan for this sub-area: Pa-S-8.1 and Pa-S-8.9. Site No. 8.1 is a low priority site designated for a future large project such as realignment of the Chinook Channel.

The regulatory shoreline boundary along the Chinook River is the 100-year floodplain.



4.42. Chinook River

#### 4.43. BAKER BAY

##### 4.43.1. General Description

This subarea includes the aquatic areas of Baker Bay and the Sand Islands. It is bounded by the west side of the Ilwaco navigation channel and by the shoreline to the north and east. On the east it is bounded by Chinook Point, and by the 30 foot depth contour to the south. The Sand Islands are the only shorelands in this subarea. The Town of Ilwaco and the Port of Ilwaco are not included in this subarea. The subarea is under the jurisdiction of Clatsop and Pacific Counties.

##### 4.32.2. Aquatic Features

The aquatic portion of this subarea includes the waters and wetlands of Baker Bay out to the North Channel. Prior to construction of the south jetty in the 1890's, Baker Bay was an open water environment, very exposed to winds and waves. Sheltered anchorage and deep water were provided at and behind Cape Disappointment; most of the bay was navigable. The mouth of the Columbia River, including Baker Bay, was an extremely dynamic environment. Channels and sand bars continually changed in size, shape, and position. Between 1839 and 1848, Sand Island was located mid-river approximately 4.3 miles south of Cape Disappointment. By 1870, the island had naturally shifted 1.55 miles to the north to a position 2.75 miles south of Cape Disappointment.

The natural northerly movement of Sand Island continued until 1885 when South Jetty construction began. While the jetty was being built, Sand Island moved into Baker Bay and enlarged. By 1910, the island stabilized in approximately its present location due to changes in current flow patterns resulting from the new jetty. The movement and stabilization of Sand Island in Baker Bay has been the largest recorded shoaling event in the bay.

Shoaling continued to occur rapidly in the bay through the 1930's. Factors contributing to this shoaling included the shelter from strong currents and waves brought on by Sand Island's presence in the bay, the effects of numerous pilings in the bay, and, possibly, the effects of diking the Chinook and Wallacut River tidelands and the increased sediment load in the Columbia River due to upriver logging and agricultural activities.

Sand Island breached and formed two islands in 1940. A great deal of sediment eroded from the gap between the islands during the occurrence of the breach. In addition, the newly opened gap resulted in scouring and deepening of the shallow flats immediately north of the islands.

The complex water exchange patterns of Baker Bay's three entrances determine the bay's circulation. A mathematical model of the bay provides the only information available on circulation. Much of the water exchange between the bay and the main channel of the estuary occurs through the entrance between East and West Sand Islands. The Ilwaco and Chinook Channel



entrances exhibit maximum ebb flows about 2 hours before high water and maximum flood flows about 2 hours after high water. The situation is reversed in the entrance between East and West Sand Islands, with maximum ebb flows about 2 hours after high water and maximum flood flows 2 hours before high water. The currents in the interior of the bay are much weaker than the currents in the bay's entrances.

Winds have a significant impact on the bay's water levels, currents, and waves. During the prevailing north and northwest winds of summer, water levels drop and the circulation patterns in the bay change. For example, an average north-flowing current in the east portion of the bay reverses and flows south. During the prevailing south winds of winter, water levels rise in the bay and the average north-flowing current of the east portion of the bay continues to flow to the north and increases in strength. The windward shores in the bay receive strong wave action.

Two tributaries flow into the bay but have little effect on the bay's circulation. The discharge of the Chinook River averages 55 cubic feet per second while the discharge of the Wallacut River averages 25 cubic feet per second.

The salinity of Baker Bay ranges from less than 0.5 to greater than 30 parts per thousand (ppt) depending on the tidal stage and the discharge of the Columbia River. During low river discharge the salinity levels in the east half of the bay range over the tidal cycle from 0.5 to 30 ppt while the salinity levels in the western half of the bay range from 5 to 30 ppt. Salinity levels during high river discharge range over the tidal cycle from less than 0.5 to 30 ppt.

The sediments of the Baker Bay Subarea are primarily poorly-sorted with mean grain sizes ranging from fine sand to coarse silt. Very fine sand, silt, and clay comprise the tidal flats of the inner bay. These tidal flats tend to have coarser sediments near the shoreline than offshore. Many of the outer bay's protected tidal flats contain sediments with mean grain sizes in the very fine sand, silt, and clay classes during high river discharge periods and in the medium to fine sand classes during low river discharge periods. Exposed tidal flats of the outer bay, such as the flat near Chinook Point, consist of sediments with mean grain sizes ranging from medium to fine sand year round. Sediments with mean grain sizes in the coarse sand class exist in the subarea on the northeast shore of West Sand Island, the southern shores of East and West Sand Islands, and in the channel between the islands.

The plant types of the Baker Bay aquatic area include phytoplankton, benthic algae, eelgrass, and brackish tidal marsh and swamp vegetation. Phytoplankton productivity has not been measured in the bay. Benthic algal productivity levels on the tidal flats and low marshes of the subarea rank among the highest in the estuary. Productivity rates are highest on the more protected tidal flats on the west side of the bay and lowest on the exposed tidal flats adjacent to the islands. The tidal flats of the inner bay and north shoreline exhibit intermediate production levels. Sparse patches of eelgrass grow on many of the tidal flats of the bay, with highest densities on the flats adjacent to Ilwaco Channel. The tidal marshes and swamps of the subarea form a narrow band around much of the shoreline. Bulrush (Scirpus americanus) dominates the colonizing (lowest elevation) low marshes while

Lyngby's sedge (Carex lyngbyei) dominates higher elevation low marshes. The high marshes contain primarily creeping bent grass (Agrostis alba), aster (Aster subspicatus), and marsh potentilla (Potentilla palustris). The swamps contain mainly willow, Sitka spruce, and alder.

Invertebrate types studied in the Baker Bay subarea include benthic infauna and epibenthic organisms. The benthic infauna consist of a very productive community dominated by clams, polychaetes, and oligochaetes. The epibenthic zooplankton community exhibits high densities on the tidal flats and slopes during spring, summer, and fall. The channels are important nursery areas for Dungeness crab.

Fish community sampling in Baker Bay has been concentrated on the tidal flats north of East and West Sand Islands and in Ilwaco Channel. Little is known about the fish utilization of the inner bay. The dominant fish species found in the bay include English sole, starry flounder, Pacific staghorn sculpin, Pacific herring, shiner perch, longfin smelt, and juvenile salmonids. Other abundant species include prickly sculpin, Pacific tomcod, snake prickleback, peamouth, and threespine stickleback.

Pacific herring, shiner perch, and longfin smelt spawn in the estuary and possibly within the Baker Bay subarea. Pacific herring spawn in the estuary from April through July. Although yearling and older herring have not been found to be abundant in the bay, herring spawning habitat (eelgrass beds) does exist in the inner bay. Larval Pacific herring appear in the estuary in spring and summer and subyearlings utilize Baker Bay as a nursery area during the same seasons. Shiner perch bear their young in the estuary in June and July and perch ranging in age from yearlings through adults are very abundant in the bay in spring, summer, and fall. Subyearling shiner perch utilize the bay as a nursery area in summer and fall. Longfin smelt spawn in the estuary from November through March and smelt ranging in age from yearlings through adults occur in the subarea year round. They are particularly abundant in summer. Larval longfin smelt appear in the estuary in winter and spring and subyearlings utilize the bay as a nursery area in summer and fall.

Several salmonid species migrate through the bay and use it as a nursery area. Subyearling Chinook salmon, originating from upriver populations and from a hatchery on the Chinook River migrate through the bay from March through August. They utilize the bay as a nursery area primarily in spring and summer but are also present in fall and winter. Yearling Chinook salmon migrate along the mouth of the bay primarily in spring. Yearling coho salmon, originating from upriver populations and from a hatchery on the Chinook River, migrate through the bay primarily in spring. The hatchery on the Chinook River also produces chum salmon.

Several bird species utilize the Baker Bay Subarea. Surf scoter, a migratory waterfowl species, winters in the bay. Other migratory waterfowl, particularly pintail, wigeon, rudy duck, and merganser, also winter in the bay. Mallard, a resident waterfowl species, feed in the bay and nest in marshes on West Sand Island. Shorebirds and great blue heron feed in the tidal flat and low marsh habitats. Shorebirds utilize the tidal flats and marshes of the entire bay while great blue heron concentrate in the western portion of the bay. Western and glaucous-winged gulls nest in a large colony

on East Sand Island in spring, summer, and fall. There is also a large Caspian tern nesting colony on East Sand Island. The bay is an important bald eagle feeding area. Two nesting pairs of eagles use the bay. Their nests are located above Cape Disappointment and Scarboro Hill. The bay is also used by numerous wintering and transitory eagles.

The harbor seal is the most abundant marine mammal species in Baker Bay. Seals occupy a haulout site on a sand flat west of Chinook Point and feed throughout the bay. The numbers of seals utilizing the bay is relatively low, with fewer than 25 animals found on the haulout at any one time.

Aquatic and terrestrial mammal use of the Baker Bay Subarea is relatively low. The narrow, fringing low marshes do not provide suitable habitat for supporting large populations of mammals. A few muskrat utilize the low marshes for feeding and some denning activity occurs near the Chinook River. Most mammal activity is concentrated in the high marsh and swamp near the Chinook River. These habitats receive use by raccoon, river otter, and deer.

#### 4.43.3. Shoreland Features

East and West Sand Islands comprise the subarea's shorelands. The islands have sandy sediments and are vegetated primarily by dune grasses and Scotch broom. There are several open sand areas, primarily at actively used dredged material disposal sites. The southern part of West Sand Island has some of the last remaining examples of a native dune grass communities on the Oregon and Washington coast.

Wildlife values on the islands are high. East Sand Island contains gull and Caspian tern nesting colonies.

#### 4.43.4. Human Use

The Corps of Engineers uses both East and West Sand Islands for dredged material disposal. The U.S. Fish and Wildlife Service and the Corps have an agreement that specifies procedures for revegetation of the islands. The Corps of Engineers revegetates the dredged material with a mixture of clover and perennial grasses and disposes dredged material on a rotating basis to allow maximum habitat establishment.

Alterations are extensive in Baker Bay. Several thousand pilings from the old fish traps remain. The Chinook Jetty and pile dikes along the southern shore of the islands were built to direct river flow toward the main navigation channel and prevent erosion of the islands. The southern shore of East Sand Island is riprapped. The remains of the pier and the railroad bed used to unload the material remain on East Sand Island.

Tidelands are owned by the States of Oregon and Washington. East and West Sand Islands are owned by the federal government. Many of the Washington tidelands have had mineral, oil, and gas rights leased. There are also leases pending for black sands mining.

There are three authorized navigation channels in Baker Bay. The Chinook Channel extends 1.3 miles between the Columbia River and the Chinook Basin. It is authorized at 10 feet deep and 150 feet wide. Shoaling problems in the Chinook Channel are severe; the worst shoal encroaches from Chinook Point to the east, opposite East Sand Island. The Ilwaco navigation channel follows a circuitous course between Jetty A to the Port of Ilwaco. The southernmost half mile of the authorized channel is 16 feet deep and 200 feet wide; the remaining 2.7 miles are 16 feet deep and 150 feet wide. The channel has a moderate shoaling problem, with the worst shoals at the outer end and at the final turn into Ilwaco. The Baker Bay East Channel, from East Sand Island to Ilwaco, is not presently maintained.

#### 4.43.5. Issues

Use conflicts in this subarea include the impacts on aquatic and terrestrial habitat of dredging, dredged material disposal, and possible future black sands mining. The eastern portion of the East Sand Island is a nesting area for Caspian terns. This area has also been used as a disposal site for maintenance dredging of the Chinook Channel; it is now nearly filled to capacity. The northwest corner of West Sand Island has been used for disposal and other parts of the island are designated for disposal.

Dredged material disposal by the U. S. Army Corps of Engineers at Area D has been a subject of continuing controversy. A report by the Columbia River Estuary Study Taskforce (Fox and Benoit: Dredged Material Disposal at Area D, 1986) found that although a portion of the material disposed at Area D may enter Baker Bay, that sediment is probably responsible for only a minor amount of total shoaling in the bay. A more recent study of sediment erosion and accretion in Baker Bay by the U. S. Army Corps of Engineers (U. S. Army Corps of Engineers, Portland District: Bathymetric Differencing in Baker Bay) found that sediments in Baker Bay had generally accreted until about 1957, when erosion began to exceed accretion. It should be noted, however, that maintenance dredging is included in the total erosion calculations. Use of Area D, which is located approximately three-quarters of a mile south of the Chinook pile dike, has been decreasing. Average annual disposal has decreased from 1,320,000 cubic yards in the 1971 through 1977 period to 742,000 cubic yards in the 1978 through 1984 period. In 1986, the latest year for which figures are available, approximately 491,994 cubic yards were disposed. The majority of sediments disposed at Area D are coarse and settle quickly. They are transported primarily as bedload. There is evidence that this sediment moves primarily upstream along the north channel. Principal sources for the material currently disposed at Area D are the Ilwaco and Chinook navigation channel, Flavel Shoals, Desdemona Shoals, and the Skipanon Waterway.

The mineral rights to most of Baker Bay have been leased for black sands mining. This mining would have unknown impacts on the bay's hydrology and biological productivity.

#### 4.43.6. Aquatic and Shoreland Designations

The intertidal areas of Baker Bay are designated Natural. The subtidal aquatic areas are designated Conservation, except for the two maintained navigation channels which are designated Development.

The shorelands of the Sand Islands are designated Conservation.

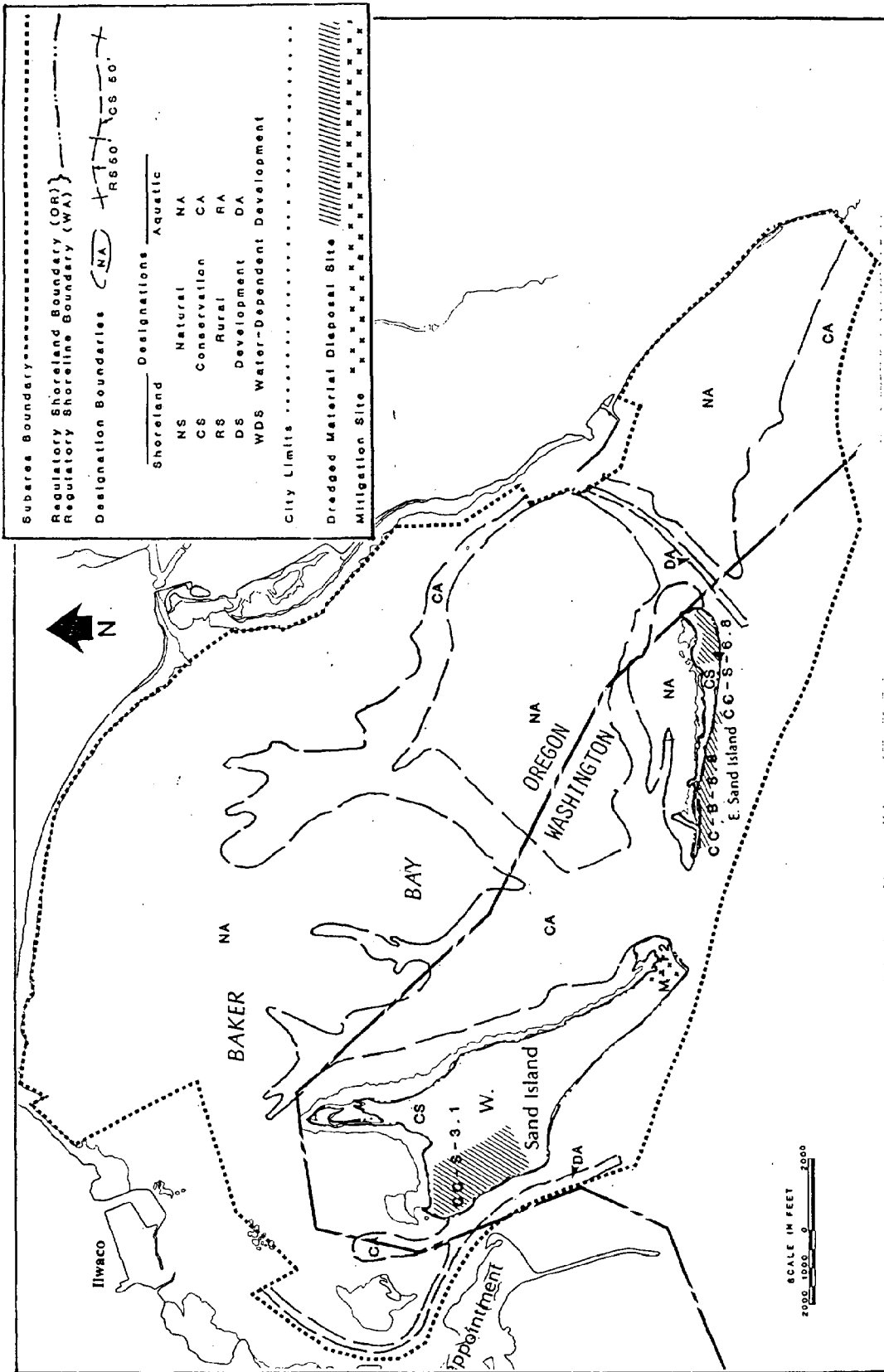
Three dredged material disposal sites are listed in the 1986 Columbia River Estuary Dredged Material Management Plan: CC-S-3.1 (on West Sand Island), CC-B-5.8, CC-S-6.8 (on East Sand Island).

A mitigation site in this subarea is described in the 1987 Columbia River Estuary Mitigation and Restoration Plan.

Both East and West Sand Islands are within the regulatory shoreland boundary of Clatsop County.

#### 4.43.7. Subarea Policies

1. The local governmental bodies, relevant agencies and interested parties shall continue to pursue the resolution of the navigational access problems in Baker Bay.
2. Channel realignments or other improvements must be justified in terms of hydraulics, sand transport and impacts on maintenance dredging.
3. Areas of future channel realignment shall be designated Development for the purpose of establishing a new navigation channel.
4. The marshes north of the Sand Islands should be protected.
5. The use of heavy equipment for activities associated with dredged material disposal on the Sand Islands is appropriate.



4.4.3. Baker Bay

#### 4.44. WALLACUT RIVER

##### 4.44.1. General Description

This subarea covers the drainage basin of the Wallacut River between the Ilwaco and Chinook River Subareas. It includes tideland soils around the Wallacut River, aquatic areas of the river, and the fringing marsh adjacent to these shorelands along Baker Bay. This subarea is under the jurisdiction of Pacific County and the Town of Ilwaco.

##### 4.44.2. Aquatic Features

The aquatic portion of the subarea includes fringing tidal marshes and flats along the shoreline and open water areas at the Wallacut River mouth. This subarea has undergone substantial changes in the past century. The Wallacut River floodplain was once a large tidal marsh and swamp partially separated from the bay by sand dunes. The Wallacut River was diked and converted to farmland in the early 1900's. The fringing marshes of the subarea formed after jetty construction eliminated ocean wave action against the bay's shoreline.

Aquatic physical and biological characteristics are similar to those described in the Baker Bay Subarea Plan.

##### 4.44.3. Shoreland Features

Most shorelands in this subarea consist of tideland soils (silty clay loams) with a low slope, and dune sands. The area of high slope to the west of the river is made up of Lytell soils. The shorelands are mostly cleared of timber for agricultural use with limited acreage left in forest. Nontidal wetlands include the Wallacut River and associated sloughs, and some low wet pasture areas. Wildlife values are high in much of the subarea. Deer and elk, along with smaller animals, frequent the area.

##### 4.44.4. Human Use

Existing uses include agriculture, suburban and rural housing and trailer parks. The primary residential area is the Vandalia subdivision, north and west of the airfield. The tideland soils are used extensively for agriculture. Remnants of dikes remain along the Wallacut River, but are no longer maintained.

Ownership is private and corporate. Existing zoning is for agriculture, general development, and residences. Mineral leases exist below mean high tide (MHT) in the tidelands.

#### 4.44.5. Issues

This subarea has significant development potential. Areas immediately east of Ilwaco have a moderate to steep slope; development should be designed to avoid erosion and slides.

The Wallacut River has silted in and historical fish runs have been virtually eliminated. The stream could support chum salmon and possibly other species if restored to former conditions.

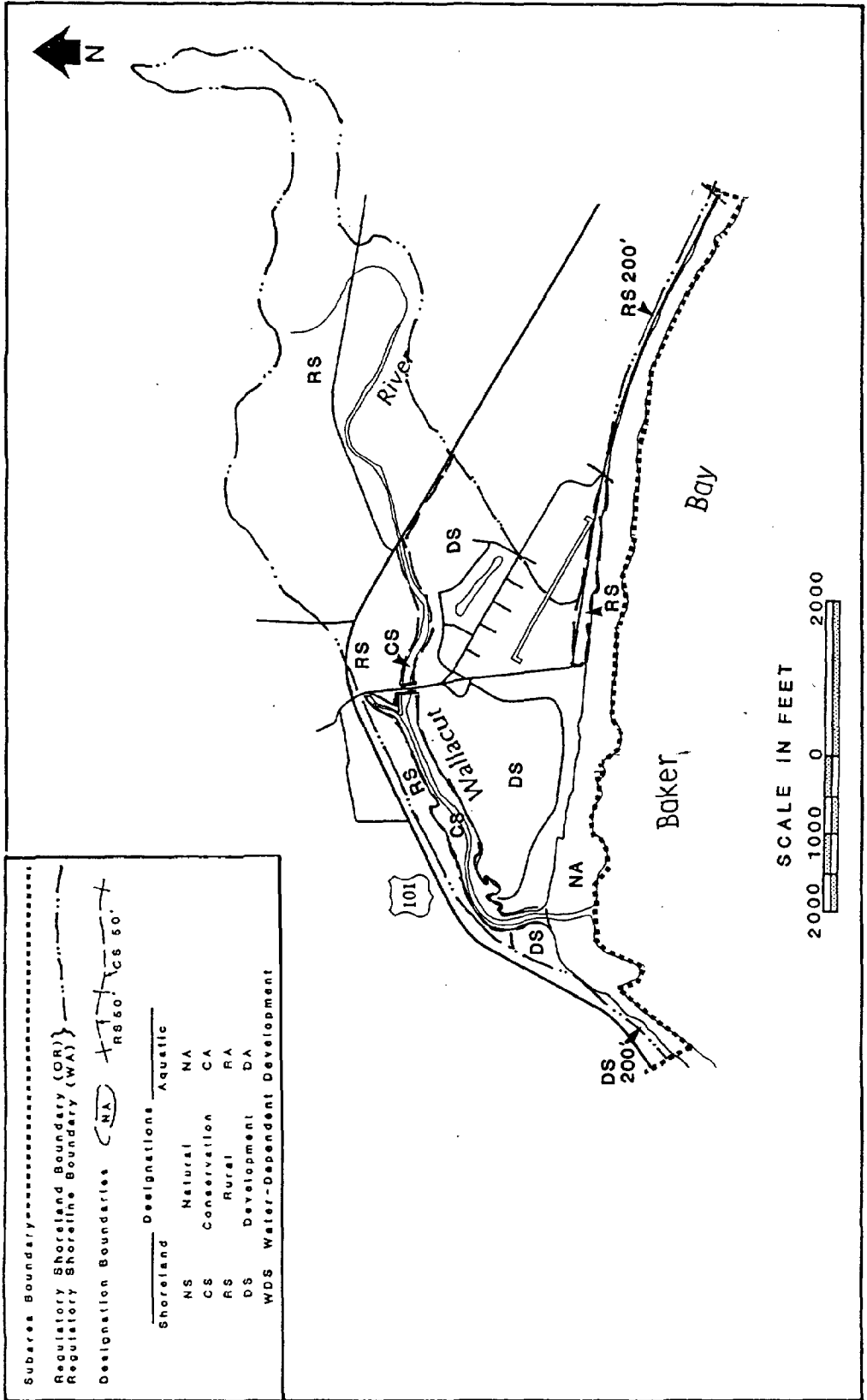
#### 4.44.6. Aquatic and Shoreland Designations

The Wallacut River is designated Conservation between the mouth and the Highway 101 bridge. The remaining aquatic areas are designated Natural.

The shoreland area between Yellow Bluff in Ilwaco and the beginning of the tideland soils is designated Development, as is the area encompassing the Vandalia subdivision. The remaining shorelands are Rural.

The regulatory shoreline boundary is the 100-year floodplain boundary along both the Wallacut River and the Baker Bay shoreline.





4.44. Wallacut River

#### 4.45. ILWACO

##### 4.45.1. General Description

This subarea includes a portion of the Town of Ilwaco, including the Port of Ilwaco. The town exercises jurisdiction over the area.

##### 4.45.2. Aquatic Features

The aquatic portion of this subarea includes the mooring basin, channel, and nearby waters and wetlands. Water depths are extremely shallow except in the boat basin and authorized channel. Aquatic physical and biological characteristics are similar to those described in the Baker Bay Subarea Plan.

##### 4.45.3. Shoreland Features

The shorelands are heavily developed within the port area with moorage and service facilities, boat repair and storage, commercial activities and offices. A town park is located at the base of Yellow Bluff. There is little bird and wildlife value due to the developed nature of the area. Adjacent areas have moderate habitat value for small animals. Soils in the port area consist entirely of fill material.

##### 4.45.4. Human Use

Existing land and water uses are dominated by the Port of Ilwaco. Activities include moorage (1,000 berths), commercial and industrial operations, offices, and boating. To the west of the Port there are canneries and a boat yard.

Tideland ownership is mixed, including the Port of Ilwaco, State of Washington, and private individuals. Shorelands are owned either by the Port or are privately owned.

##### 4.45.5. Issues

The Port of Ilwaco has potential for expansion. The CREST Marina Study (1978) found unfilled demand for both recreational and commercial fishing vessel moorage. The 200 mile Exclusive Economic Zone has stimulated additional demand for moorages for larger commercial fishing vessels. The Port of Ilwaco is well-situated, close to the mouth of the river, to accommodate this demand.

The existing channel into the Port of Ilwaco has been deepened to 16 feet by the U.S. Army Corps of Engineers. Channel realignment was examined in the early 1980's, but dropped after the channel was deepened.

#### 4.45.6. Aquatic and Shoreland Designations

The navigational access channel is designated Development. The aquatic area fronting the Port of Ilwaco between the Port's property lines out to the outer harbor line is designated Development. Tidal marshes on the east side of this subarea are Natural.

The shoreland area is designated Development.

There is one dredged material disposal site listed in the 1986 Columbia River Estuary Dredged Material Management Plan: Pa-S-3.2. The site is located at the Port of Ilwaco on fill land. The site is used as a stockpile for basin and entrance channel maintenance material.

The regulatory shoreline boundary in this subarea is 200 feet landward of the shoreline.

#### 4.45.7. Subarea Policies

1. Port of Ilwaco and its entrance channel expansion should be done so as to minimize damage to the aquatic productivity, maintain water quality and flushing, and avoid aggravating the shoaling problem of the Bay. Before any further aquatic areas are filled, existing land areas should be fully utilized and economically feasible upland alternatives exhausted. Dry boat moorage should be considered as an alternative to basin expansion.
2. Unless a suitable upland disposal site can be found, the port should consider maintaining a stockpile site so that material from the mooring basin and inner channel can be rehandled.
3. The Development Aquatic designations which are provided to accommodate potential future expansion of the Port do not automatically create the presumption that dredging, filling or other alternatives will automatically result. Specific proposals for Port expansion must be justified in terms of available alternatives, water quality impacts and economic benefits, and must meet other requirements of the permit process.
4. This plan recognizes navigational access problems in Baker Bay. Local governmental bodies, relevant agencies and interested parties shall continue to pursue the resolution of those problems. Approved channel realignments and/or improvements shall be permitted notwithstanding the designations of this plan.



#### 4.46. FORT CANBY NORTH

##### 4.46.1. General Description

This subarea includes the shorelands between the northern boundary of the State Park boat launch ramp and the Ilwaco city limits. The in-water boundary is the western edge of the entrance channel. The subarea is under the jurisdiction of Pacific County. It includes parts of Fort Canby State Park and the U.S. Coast Guard Station.

##### 4.46.2. Aquatic Features

The aquatic portions of this subarea include the waters and wetlands along the west shore of Baker Bay. Extensive sedge and bulrush marshes have developed in the smaller embayments. Water depths are shallow between the marshes and the channel. The aquatic physical and biological characteristics are similar to those in the Baker Bay Subarea Plan.

##### 4.46.3. Shoreland Features

Shorelands include forested areas inland to the limit of Shoreline Management jurisdiction. Bird and wildlife values are high and include deer and smaller furbearers. Soils in this area include the Yaquina and Zenker associations, and slopes are moderate to steep. Some old forest exists along the shoreline, predominantly Sitka spruce. There is a bald eagle nest on the hills between Fort Canby and Ilwaco.

##### 4.46.4. Human Uses

Existing land and water uses include boating, fishing, and housing. Adjacent uses include forest management, recreation, Coast Guard residences and operations, and the developed area in Ilwaco. Tidelands are owned by the Washington Department of Natural Resources or Washington State Parks. Shorelands are owned by the state and federal governments.

##### 4.46.5. Issues

No major planning issues affecting this subarea were identified during the original Columbia River Estuary Regional Management Plan development or during the 1987 Plan update.

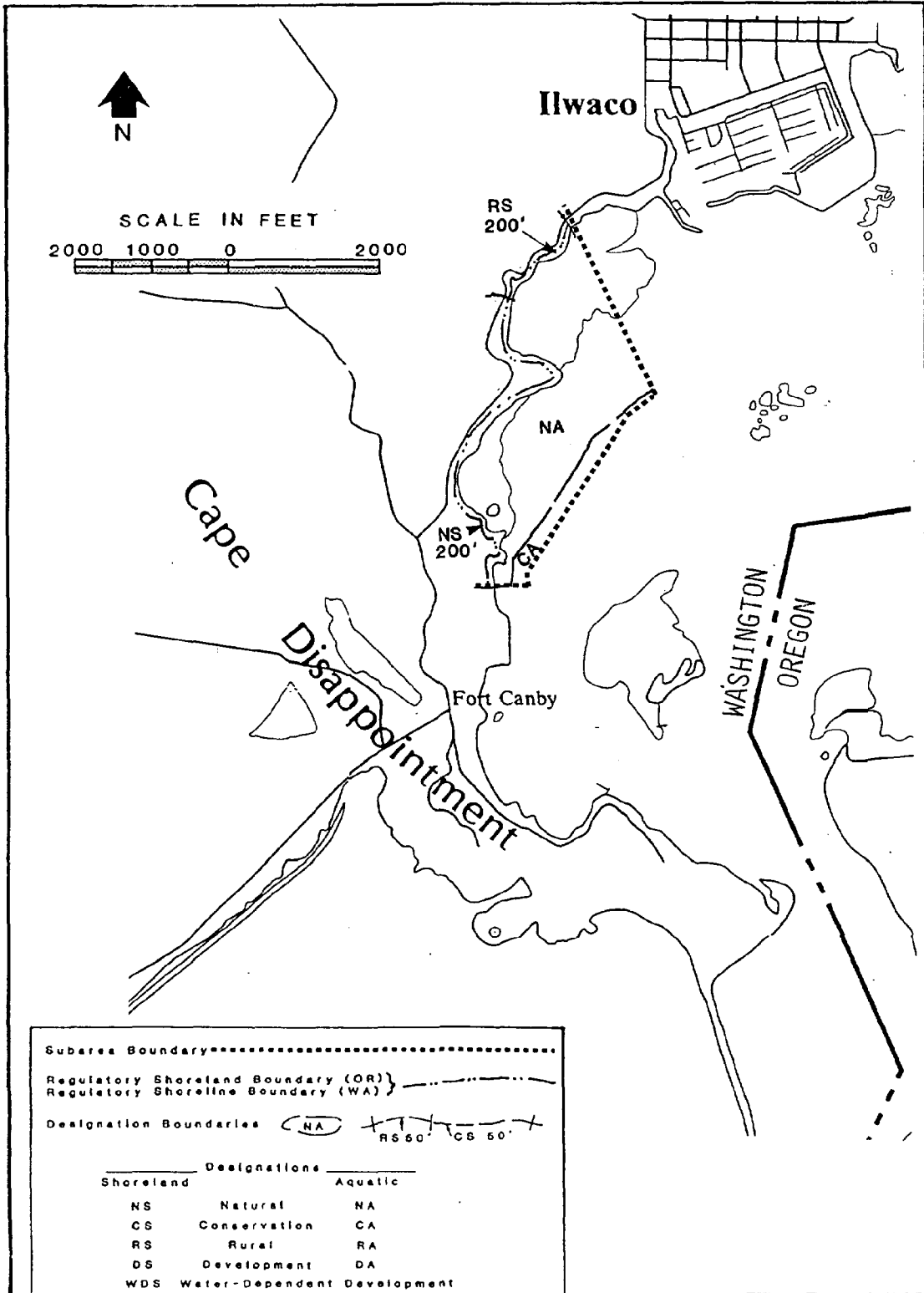
#### 4.46.6. Aquatic and Shoreland Designations

Intertidal aquatic areas, including marshes and tidal flats, are designated Natural. Subtidal aquatic areas up to the edge of the channels side slopes are designated Conservation.

The shoreland designations in this area are Natural in the undeveloped portion of the State Park north of the boat launch ramp, and Rural north to the city limits of Ilwaco.

#### 4.46.7. Subarea Policies

1. The existing loop trail should be extended along the shoreline to the Town of Ilwaco.



4.46. Fort Canby North

#### 4.47. CAPE DISAPPOINTMENT

##### 4.47.1. General Description

This subarea extends from the tip of the North Jetty, east to the western side of the Baker Bay entrance channel. The shoreland area, all of which is in Fort Canby State Park or the Coast Guard Base, includes 200 feet of Benson Beach north of the Jetty, all of Cape Disappointment, the accreted lands to the east of Jetty A, and the shorelands of Baker Bay north to the northern boundary of the State Park boat launch. Aquatic areas include portions of Baker Bay west of the navigation channel between Jetty A and the northern boundary of the subarea; the waters between Jetty A and the North Jetty in the main Columbia River; minor sloughs and wetlands behind the North Jetty. This subarea is under the jurisdiction of Pacific County.

##### 4.47.2. Aquatic Features

The aquatic portions of the subarea include the nearshore waters east of Cape Disappointment and the waters between Jetty A and the North Jetty. Cape Disappointment was the northern side of the Columbia River mouth prior to jetty construction. The river mouth has moved seaward and sediment has accreted north of the jetty since its construction.

Aquatic physical and biological characteristics along the east side of Cape Disappointment are similar to those described in the Baker Bay Subarea Plan. Characteristics of the remaining aquatic areas are similar to those described in the Mouth of the Columbia River Subarea Plan.

Additional notable biological features of the subarea include the extensive use of Jetty A tideflats by shorebirds and seabird nesting on Cape Disappointment. There is a nesting colony of pelagic cormorants on the cliffs. They feed in the adjacent waters. Gulls and pigeon guillemots have also been observed nesting on the cliffs.

##### 4.47.3. Shoreland Features

Shorelands include beach areas, the rocky promontories of Cape Disappointment, and accreted land east of Jetty A. Wildlife value is high in the state park area for deer and smaller furbearing animals. Gulls, pelagic cormorants and other marine birds predominate on the cliffs. Soil types include dune-sand (north of North Jetty and east of Jetty A) and silt and clay loams (on Cape Disappointment). Uplands are steep and rocky.



#### 4.47.4. Human Use

This subarea is entirely in public ownership. The State of Washington owns the state park and the federal government owns Cape Disappointment. Existing land and water uses include fishing, boating, State Park recreational activities, and a Coast Guard Station which includes both operations and housing.

#### 4.47.5. Issues

The Coast Guard has indicated that it may expand its dock facility. This project may involve limited filling and placement of piling. Other potential developments would depend on future plans in the State Park. Provision has been made for expansion of parking facilities at the North Jetty.

#### 4.47.6. Aquatic and Shoreland Designations

The rocky intertidal aquatic areas of Cape Disappointment are designated Natural. The Coast Guard pier and waters between the shore and channel and within 50 feet on either side of the Coast Guard pier are designated Development to provide for maintenance and improvement of the present facilities. All other aquatic areas are designated Conservation.

The North Jetty, Jetty A, the developed shoreland parts of the Coast Guard base, the Cape Disappointment lighthouse, the Lewis and Clark Interpretive Center, and the State Park concession stands are designated Development. The outermost State Park parking lot is designated Conservation and should not be expanded. The second parking lot is designated Development with an expanded area to accommodate future demand. Additional Conservation designated areas include the low-lying shoreland areas east of the headland and Jetty A, the lands north of the North Jetty, the other low-lying undeveloped parts of Fort Canby State Park, and the 50-foot buffer strips surrounding Development areas. Other state and federally owned shorelands at Cape Disappointment, including the rocky bluffs on the south and east, and the old growth forested areas are designated Natural.

There is one dredged material disposal site listed for this subarea in the 1986 Columbia River Estuary Dredged Material Management Plan: Pa-S-3.0. The site could be used to deposit material from maintenance dredging of the Ilwaco Channel.

The 1987 Columbia River Estuary Mitigation and Restoration Plan identifies a mitigation site in the subarea.



## 5. CUMULATIVE IMPACTS

### 5.1. INTRODUCTION

This section addresses the potential combined effects of certain activities on the estuary. The primary reason for addressing cumulative impacts is that they can not be adequately considered during most permit reviews, yet under certain conditions can become significant planning issues.

A second reason for considering cumulative impacts in this plan is that Oregon and Washington local jurisdictions are required by state statutes to address them. Comprehensive Plan Requirement 5 of Oregon Statewide Planning Goal 16 states that local jurisdictions must "Consider and describe in the plan the potential cumulative impacts of the alterations and development activities envisioned." Washington local governments are required by the Washington Shoreline Management Act to evaluate the potential cumulative impacts of certain types of developments plus other future and past similar developments (WAC 173-14-140(4)). The Washington Environmental Policy Act also requires consideration of cumulative impacts (WAC 197-11-060(4) and WAC 197-11-792(2c)).

### 5.2. SCOPE

Discussion of cumulative impacts in this Plan is limited to six major topic areas. Cumulative impacts on Public Access, Water Quality, Fisheries, Maritime Commerce, Recreation/Tourism, and Circulation are identified and discussed. In many cases cumulative impacts are both positive and negative. Navigation channel maintenance dredging, for example, generates beneficial impacts with respect to maritime commerce, and some harmful impacts with respect to fisheries habitat. Public Access, as another example, is affected in a positive way by boat ramp construction, and negatively by riprap shoreline protection. Cumulative impacts that are significant only in certain estuary subareas are described in the subarea plans in Section 4.

Cumulative impacts on the six estuarine categories of estuarine resources identified above are generated by a number of activities. The following are considered in this section:

1. Dredging - New and Maintenance
2. Dredged Material Disposal - Aquatic and Shoreland
3. Filling
4. Riprap
5. Boat Ramps - New and Expanded
6. Marinas - New and Expanded

7. Moorages - Individual
8. Aquaculture and Fish Hatcheries
9. Port Development
10. River Training.

Some activities with important cumulative impacts on the estuary are not regulated by this plan, and are not considered in this section. Chief among these are:

Forestry

Upstream Activities

Activities in the Ocean Outside of the Estuary Planning Area

Fisheries Harvest Allocations

Local Point-source and Non-point Source Discharge

River Discharge Decisions

Navigation.

### 5.3. CUMULATIVE IMPACT ANALYSIS

#### 5.3.1. Public Access

Activities generating cumulative impacts on public access can both enhance and reduce opportunities for public access to the waters and shorelines of the Columbia River Estuary. Public access is treated broadly here to include both physical and visual access.

The cumulative impact of maintenance dredging projects on public access is limited and to some extent beneficial. Main navigation channel maintenance dredging generates no identifiable cumulative impacts on public access opportunities. Boat ramp and marina access channel dredging has the cumulative effect of maintaining or improving small boat access. The cumulative impacts of new dredging on public access are similar to those of maintenance dredging.

Use of designated shoreland and aquatic dredged material disposal sites will have little measurable cumulative impact on public access in the Columbia River Estuary. Beach nourishment will have positive cumulative effects on public access, but only to the extent that enhanced beaches are used by the public.

Filling Columbia River Estuary aquatic areas along the shoreline will have a generally negative impact on public access. Only limited

areas along the shoreline are designated for fills, so cumulative impacts on public access should not be great.

Riprap bank protection can, under certain circumstances, have significant negative cumulative impact on public access, especially physical shoreline access. Riprap can also have beneficial impacts on public access by protecting marinas and boat ramps.

Boat ramps and marinas have a strongly beneficial cumulative impact on public access for the boating public. Private individual moorages on the other hand can have negative cumulative impacts with respect to public access if allowed to overcrowd particular waterways. Continuous development of individual moorages along a reach of the Columbia River Estuary or a tributary can block public shoreline access and inhibit small boat navigation, having a strongly negative cumulative impact.

Aquaculture and hatchery development may, under certain circumstances, generate adverse cumulative impacts on public access. If large near-shore water areas are leased and used for net pens, for example, public access could be substantially reduced. Pond aquaculture facilities on shorelands, on the other hand, would be expected to have a little or no adverse cumulative impact.

Port development is often not fully compatible with public access; however, the cumulative impact of port development on public access is expected to be minor. Port development is limited to only a few sites in the estuary. Full development of all existing designated Development and Water Dependent Development shorelands would not significantly reduce public access opportunities in the Columbia River Estuary.

River training activities, including pile dikes and dredged material disposal islands, have had little or no cumulative impact on public access.

### 5.3.2. Water Quality

A number of parameters are considered under water quality: turbidity, dissolved oxygen, biochemical oxygen demand, organic contaminants, metals, and other undesirable compounds. Both long-term and short-term water quality impacts are considered.

New and maintenance dredging projects can have cumulative short-term impacts, especially with respect to turbidity. Rarely, however, are more than a small number of dredging projects occurring at one time. Longer-term cumulative impacts are less significant. Aquatic and shoreland dredged material disposal can generate significant cumulative impacts on Columbia River Estuary water quality. Pollutants associated with fine sediments can be resuspended as a result of aquatic dredged material disposal. Land disposal can also generate water quality impacts by way of contaminated runoff. Rarely, however, are more than a small number of disposal projects occurring at one time. Because impacts associated with dredging and dredged material disposal tend to

be short-lived, the potential for generating significant cumulative impacts on water quality is limited.

Filling of aquatic areas is expected to generate only minor, short-lived impacts if conducted with clean material behind protective berms. Fills constructed without these protective measures do have the potential for generating water quality problems associated with leachates from contaminated fill material. Large waterfront areas in some parts of the estuary consist entirely of fill material: in these areas the potential for cumulative water quality impacts may be high.

Riprap constructed from clean non-erodable stone generates few potential water quality impacts. Inasmuch as it may displace riparian vegetation, riprap may result in higher-turbidity runoff entering the river. The cumulative impact of riprap on water quality may be considerable to the extent that riparian vegetation is lost.

Boat ramps and individual moorages are expected to have no significant cumulative impact on water quality. Enclosed marinas, however, can generate local water quality impacts. To the extent that marinas are located near each other, or are concentrated in poorly flushed tributaries, cumulative impacts may be considerable.

Aquaculture and fish hatcheries are potentially detrimental for water quality if uneaten fish food and fish wastes accumulate and decompose on the site rather than dispersing. Significant cumulative impacts would be expected only to the extent that several operations are clustered together, or they occur in a small or poorly flushed waterway, or if a single operation is very large relative to the waterway's flushing volume.

Port development has occurred in the estuary without any significant cumulative water quality impacts. Increased port activity increases the likelihood of water quality degrading actions such as oil or chemical spills.

River training activities may affect water quality by changing flushing patterns. The cumulative impact of river training on flushing has been to decrease flushing away from the main navigation channel, and increase flushing near the channel. Because little is known about the relationship between flushing and water quality at specific locations on the Columbia River Estuary, the cumulative impact of river training on water quality is difficult to evaluate.

### 5.3.3. Fisheries

Discussion of cumulative impacts on fisheries includes impacts on commercial, recreational, and uneconomic non-game species. Impacts on their habitats are also included.

Dredging can have measurable impacts on fish by disrupting feeding and shelter areas as well as migration routes. Project scheduling can reduce some of these impacts. Long-term impacts which might generate

significant cumulative impacts are not well understood. Crab entrainment resulting from bar maintenance dredging may have significant impacts on the population of juvenile crabs at the bar, but its impacts on the overall estuary and off-shore crab populations are unknown.

Dredged material disposal can affect fish by affecting water quality. This is discussed in subsection 5.3.2..

Filling can affect fish and their habitats by disrupting migration routes, and by eliminating benthic communities that are a component of their habitat. Lost habitat will presumably be replaced by way of compensatory mitigation measures. Potential fill sites in the Columbia River Estuary are not so numerous as to generate significant cumulative impacts, as long as mitigation measures are applied.

Riprap may affect fish habitat by disrupting shallow water benthic communities and by eliminating near-shore shallow water areas. The benthic communities are a component of fish habitat. Near-shore shallow areas may be important as resting, shelter and migration routes for downstream juvenile anadromous fish. Large reaches of shoreline are riprapped, so the potential for cumulative impacts may be high. However, to the extent that riprap projects tend to be placed on eroded or erodable shorelines, these impacts may be reduced somewhat.

Boat ramps, marinas, and moorages are all essential components of the commercial and recreational fisheries support system in the Columbia River Estuary. To the extent that commercial and game harvests are subject to regulation, these facilities will not generate significant negative impacts on fish populations. Water quality impacts associated with small boat moorage may generate relatively minor, localized cumulative impacts on fish.

Aquaculture and fish hatchery facilities have the potential for generating both positive and negative cumulative impacts on fisheries. Positive impacts can result from fisheries enhancement programs associated with hatcheries and with aquaculture release programs. Negative impacts can be generated from confinement aquaculture and hatchery operations that develop fish diseases which in turn infect wild stocks. Significant harmful cumulative impacts would be expected when operations are concentrated in small or poorly-flushed waterways.

Port development's expected impacts on fisheries are more associated with dredging and filling than with port activity by itself. Some potential impacts are described in subsection 5.3.2. Fish populations, distribution, and diversity may be related to port activity, but significant cumulative impacts have not been identified.

River training affects fish habitat by altering migration routes. Upstream migrant anadromous fish follow the strong ebb currents associated with the main navigation channel. Significant cumulative impacts on fisheries may be associated with river training.

#### 5.3.4. Maritime Commerce

Cumulative impacts on maritime commerce are considered in this subsection. Included are deep-draft moorage, navigation and associated activities.

Dredging has had beneficial cumulative impacts on maritime commerce. A large share of all dredging in the estuary is carried out to accommodate maritime commerce. The cumulative impacts of channel maintenance dredging on navigation are significant. Reduced dredging at any of the numerous shoals or at the bar would significantly impede deep-draft commerce in the Columbia River Estuary.

Land disposal of dredged material has had no measurable cumulative impact on maritime commerce. Aquatic disposal can affect navigation to the extent that some of this material may settle in the channel and contribute to shoaling. This impact is cumulatively small, especially when frequent and thorough maintenance dredging of the channels is considered.

Filling of the Columbia River Estuary has few significant impacts on navigation and maritime commerce. Shoreline fills are evaluated for impacts on navigation. The bulkhead and pierhead lines established on the river are intended to avoid fill and pier-related impacts on navigation. The cumulative impacts of fill on maritime commerce are negligible.

Riprap has few significant impacts on navigation, except those beneficial ones associated with protecting shorelines from ship wakes. The cumulative effect of long protected shorelines is that they allow deep-draft navigation close to shore without causing shoreline erosion.

Boat ramps and marinas have no significant cumulative impact on maritime commerce. Deep-draft moorage opportunities in the Columbia River Estuary have a direct beneficial impact on maritime commerce.

Aquaculture and fish hatcheries are expected to have no measurable impacts on navigation and maritime commerce.

Port development has direct, positive impact on maritime commerce in the Columbia River Estuary. The cumulative impact of port development in the Columbia River Estuary is related to the stimulation of maritime commerce.

River training efforts generate direct positive cumulative impacts on navigation by keeping navigation channels relatively free of obstructions, and lowering maintenance costs.

#### 5.3.5. Recreation/Tourism

Discussion of cumulative impacts on recreation and tourism includes estuary-oriented recreation undertaken by both local residents and by visitors from outside the region. Many impacts may be largely aesthetic



in nature.

Dredging results in changes that are for the most part invisible, unless intertidal areas are dredged. Dredging for small boat access and maintenance dredging of small boat facilities is beneficial with respect to some segments of the recreation and tourism sector.

Dredged material disposal at upland sites generates both positive and negative impacts. Beach nourishment may have beneficial impacts on recreation and tourism, but only to the extent that nourished beaches are accessible. Other types of upland disposal may yield negative impacts with respect to aesthetic features, depending on location. Aquatic dredged material disposal could have impacts on recreation and tourism with respect to water quality and recreational fisheries, discussed in subsections 5.3.2. and 5.3.3. Dredged material disposal's cumulative impacts are not expected to be significant with respect to recreation and tourism.

Filling Columbia River Estuary aquatic areas may negatively impact recreation and tourism if the fill is used for facilities that do not support these activities. Because filling in the Columbia River Estuary is limited to a few sites, cumulative impacts are expected to be minor.

Riprap may have cumulative impacts on recreation or tourism. Extensive riprap protection of otherwise undeveloped shorelines will yield undesirable aesthetic impacts, and impede public access. On the other hand, riprap may be needed to protect important recreational and visitor-oriented facilities (such as marinas). Large stretches of shoreline in the estuary are riprapped, and cumulative impacts may be significant.

Boat ramps, marinas, and moorages have a generally positive impact on recreation and tourism, though there may also be a negative aesthetic component. The net cumulative impact is probably positive, however, because the estuary is large relative to the extent of existing recreational boat facilities.

Aquaculture and fisheries generate both beneficial and harmful impacts on recreation and tourism. Benefits are realized to the extent that hatcheries produce game fish, and inasmuch as the hatcheries and aquaculture facilities have a visitor-oriented component. Negative impacts are mainly aesthetic, and related to water quality. Cumulative negative impacts are expected only when facilities become concentrated in small waterways, or when very large facilities are developed.

Port development may generate both positive and negative impacts with respect to tourism and recreation. The passage of deep-draft vessels up and down the Columbia River Estuary, together with associated tug, barge and wharf activities, are significant elements of the Columbia River Estuary's attractiveness for visitors. Port development may also, however, generate negative impacts on recreational fishing and public access (see subsections 5.3.3. and 5.3.1.). Net cumulative impacts are believed to be positive, and probably substantial.

River training probably has little cumulative impact on recreation and tourism outside of minor aesthetic detractions such as pile dikes.

#### 5.3.6. Circulation

Discussion of cumulative impacts on circulation includes erosion, accretion, flooding, salinity intrusion, and related phenomena.

Dredging projects have had significant cumulative impacts on circulation, particularly larger projects like the main navigation channel. New projects will generate larger impacts than maintenance projects, other parameters being comparable. The cumulative impact of smaller dredging projects is probably minor unless several small projects are concentrated in an area.

Dredged material disposal in the water should have relatively minor cumulative impacts on circulation. Land disposal practices should have no measurable cumulative impact on circulation.

Filling has had a substantial impact on circulation. Shoreline fills alter near-shore currents and can create eddies and other current aberrations. Diking on tributaries can reduce the tidal prism, substantially lowering flushing and thus increasing shoaling rates. Small shoreline fills are not expected to have significant cumulative impacts on circulation unless concentrated along a single reach of shoreline.

Riprap is intended to reduce shoreline erosion, so its net cumulative impact on this component of circulation is probably significant and positive. Depending on slope and rubble size, riprap projects can, in some instances, generate unintended impacts on adjacent unprotected shorelines. There is no evidence, however, of a significantly negative cumulative effect of riprap along shorelines with respect to this aspect of circulation.

Boat ramps and marinas are so small and widely spaced that cumulative circulation impacts are not expected. Individual moorages can, when concentrated along a shoreline, have undesirable negative impacts on currents. Their cumulative impact is potentially significant, but there are no data verifying this.

Aquaculture and fish hatcheries have little impact on circulation. They are generally designed to take advantage of flushing waters, rather than interfere with them. Cumulative impacts, if there are any, are not expected to be significant.

Port development's impact on circulation is probably restricted to associated dredging and filling. Where the main navigation channel is close to shore, erosion may result from shipwakes. Navigation and maritime commerce are not expected to generate, by themselves, significant cumulative circulation impacts.

River training efforts are directly related to circulatory changes in the Columbia River Estuary. They have generated intentionally significant cumulative impacts.

## 6. PLAN IMPLEMENTATION

### 6.1. INTRODUCTION

This section describes some aspects of Columbia River Estuary Regional Management Plan implementation. Implementation is a critical step in the planning process between policy formulation and evaluation of results. The county and municipal governments that choose to adopt the Regional Management Plan rely on a range of tools and techniques to implement the plan's goals and objectives.

The Columbia River Estuary Regional Management Plan is, when adopted by local governments along the Estuary, a component of the Coastal Zone Management Plan for the Columbia River Estuary. The federal Coastal Zone Management Act authorizes states to engage in comprehensive planning activities in the coastal zone. Oregon and Washington have, in turn, required that local governments prepare plans for coastal areas and resources. The Washington Shoreline Management Act and the Oregon Statewide Planning Goals establish standards for these local plans. The Columbia River Estuary Regional Management Plan meets these standards. It fulfills the plan development obligation with respect to the estuary for participating local governments.

### 6.2. INCORPORATION BY LOCAL GOVERNMENTS

The Columbia River Estuary Regional Management Plan is implemented by the local governments that adopt it. It is developed specifically for the eight estuary area local governments: Astoria, Cathlamet, Hammond, Ilwaco, Warrenton, Clatsop County, Pacific County and Wahkiakum County. The Regional Management Plan is implemented by Washington jurisdictions through their Shoreline Management Master Plans. Oregon jurisdictions implement the Regional Management Plan by incorporating it into local comprehensive plans and zoning ordinances.

Jurisdictions will not need to adopt the entire Columbia River Estuary Regional Management Plan in order to implement it. Tables 6-1 through 6-8 summarize the sections needed for each jurisdiction's plan.

### 6.3. LOCAL PLAN IMPLEMENTATION

#### 6.3.1. Oregon Jurisdictions

Astoria, Hammond, Warrenton and Clatsop County implement their Comprehensive Plans, including adopted portions of the Regional Management Plan, through implementing zoning ordinances. Regulated uses and activities must meet the plan policies, zoning ordinance standards, and zoning map designations. Oregon jurisdictions utilize a generally hierarchical system of permits. The permit system includes conditional use permits, review use permits, and permits issued "over-the-counter." The Columbia River Estuary Regional Management Plan Aquatic and Shore-

land Designations are adopted as zones on the local jurisdiction's zoning map.

### 6.3.2. Washington Jurisdictions

Cathlamet, Ilwaco, Pacific County and Wahkiakum County implement the Shoreline Management Master programs by reviewing projects under substantial development permits and variance permits. Uses and activities must meet the Master Program policies, standards and environment requirements. The Columbia River Estuary Regional Management Plan Aquatic and Shoreland designations are adopted as environment designations in the local Shoreline Management Master Program.

### 6.3.3. Federal Consistency

Section 307 of the Federal Coastal Zone Management Act (CZMA) requires that applicants for federal permits in the Coastal Zone submit to the state information and data showing that the proposal is consistent with the state's approved coastal zone management program. Local Shoreline Management Master Programs in Washington and local Comprehensive Plans and Zoning Ordinances in Oregon constitute significant parts of each state's approved program.

There are two ways consistency may be demonstrated. Most permit applicants will demonstrate consistency with Oregon's or Washington's Coastal Zone Management program by applying for and receiving approval of the necessary local permit. A federal permit can then be issued because it will be consistent with the local element of the state Coastal Zone Management Program. Consistency determinations are handled differently, however, when the proposed use or activity occurs on federally-owned land and when the project applicant would be a federal agency.

Federal agencies do not obtain local permits for their projects. Instead, they demonstrate to the Washington Department of Ecology or to the Oregon Department of Land Conservation and Development that the proposed federal action will be consistent, to the maximum extent practicable, with the state's approved Coastal Zone Management program. This is done by way of correspondence between the federal agency and either the Washington Department of Ecology or the Oregon Department of Land Conservation and Development, rather than through the local permit process.

Local government input into this process can be in two different forms. The local jurisdiction is frequently asked by the federal agency for information needed for the consistency demonstration. In this case, the local government responds by pointing out the policies, standards, and other criteria from their Shoreline Management Master Program or local Comprehensive Plan/Zoning Ordinance that are germane to the project. Alternatively, or in addition to this, the local government

may comment to the Washington Department of Ecology or Oregon Department of Land Conservation and Development on a pending consistency determination.

#### 6.4. COLUMBIA RIVER ESTUARY REGIONAL MANAGEMENT PLAN REVIEW AND AMENDMENT

The Regional Plan has not been subject to frequent amendment. There are a number of circumstances under which the Plan may be amended:

1. The CREST Council may initiate and adopt a Plan amendment in response to a request from a member, new information on the estuarine ecosystem, or a change in the circumstances that support a Plan component.
2. CREST members will, from time to time, amend their local comprehensive plans, zoning ordinances and shoreline master plans in ways that affect the regional plan. It may be appropriate to incorporate such changes into the Columbia River Estuary Regional Management Plan.
3. The States of Oregon and Washington will periodically require local jurisdictions to update their shoreline management plans and their comprehensive plans. The Columbia River Estuary Regional Management Plan should also be updated during these required local updates in order to maintain regionalism.
4. Changes in Oregon, Washington, and federal regulations affecting estuarine development may require that the Columbia River Estuary Regional Management Plan be amended.

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  - 2.3.4. Development Aquatic Designation and Use List
  - 2.3.5. Natural Shoreland Designation and Use List
  - 2.3.6. Conservation Shorelands Designation and Use List
  - 2.3.7. Rural Shorelands Designation and Use List
  - 2.3.8. Development Aquatic Designation and Use List
- 3.2. Definitions
- 3.3.1. Agriculture and Forestry Policies and Standards
  - 3.3.2. Deep Water Navigation, Port and Industrial Development Policies and Standards
  - 3.3.3. Diking Policies and Standards
  - 3.3.4. Dredging and Dredged Material Disposal Policies and Standards
  - 3.3.5. Estuarine Construction Policies and Standards
  - 3.3.6. Filling of Aquatic Areas and Non-Tidal Wetlands Policies and Standards
  - 3.3.7. Fish and Wildlife Habitat Policies and Standards
  - 3.3.8. Fisheries and Aquaculture Policies and Standards
  - 3.3.9. Land Transportation Systems Policies and Standards
  - 3.3.10. Log Storage Policies and Standards
  - 3.3.11. Mining and Mineral Extraction Policies and Standards
  - 3.3.12. Mitigation and Restoration Policies and Standards
  - 3.3.13. Public Access Policies and Standards
  - 3.3.14. Recreation and Tourism Policies and Standards
  - 3.3.15. Residential, Commercial, Industrial Development Policies and Standards
  - 3.3.16. Shallow Draft Ports and Marinas Policies and Standards
  - 3.3.17. Shoreland Hazard Areas Policies and Standards
  - 3.3.18. Significant Areas Policies and Standards
  - 3.3.19. Water Quality Maintenance Policies and Standards
  - 3.3.20. Water-Dependent Development Areas Policies and Standards
  - 3.3.21. Implementation Policies and Standards
- 3.4.3. Washington Jurisdiction Regulations (State Environmental Policy Act Checklist)
- 4.3. Estuary Channels Subarea Plan
  - 4.4. Estuary Sands Subarea Plan
  - 4.5. River Channels Subarea Plan
  - 4.33. Puget Island
  - 4.34. Eastern Wahkiakum County
  - 4.35. Cathlamet/Whitetail Deer Refuge
  - 4.36. Skamokawa to Three Tree Point
  - 4.37. Three Tree Point to Harrington Point
  - 4.38. Grays Bay and Tributaries



5. CUMULATIVE IMPACTS

- 5.1. Introduction
- 5.2. Scope
- 5.3. Cumulative Impact Analysis

6. CREST PLAN IMPLEMENTATION

- 6.1. Introduction
- 6.2. Incorporation by Local Governments
- 6.3. Local Plan Implementation
- 6.4. Columbia River Estuary Regional Management Plan Review and Amendment

APPENDIX A

CREST CHARTER

## CHARTER AND AGREEMENT

### COLUMBIA RIVER ESTUARY STUDY TASKFORCE (CREST)

This Charter and Agreement is made pursuant to Oregon Revised Statutes, Chapter 190 and the Revised Code of Washington, Chapter 39.34, and entered into this 23rd day of Aug., 1984, by and between the member agencies that adopted the attached resolution.

#### 1. DEFINITIONS

- 1.1 Council: The group of persons (Delegates or Alternates) appointed by the member jurisdictions vested with the responsibility of the management of the affairs of CREST and the formation of policy.
- 1.2 Estuary Area: The estuary area is defined as the water and submerged lands of the Columbia River estuary and its tributary streams, the associated tidelands, wetlands, shorelands within Pacific and Wahkiakum Counties in Washington and within Clatsop County in Oregon.

#### 2. ESTABLISHMENT

The Columbia River Estuary Study Taskforce, hereinafter referred to as CREST, is hereby continued by agreement among its member jurisdictions.

#### 3. OBJECTIVE

CREST, a regional estuarine management organization, is to provide local jurisdictions and other groups, agencies, and individuals with assistance in estuarine management, planning and plan implementation.

#### 4. PURPOSE

The purposes of CREST are:

- 4.1 Forum: To provide a forum for elected officials of member jurisdictions to present substantive issues of local concern and to jointly identify issues which are regional in scope; to recommend and review governmental activities related to the development and management of the natural, economic, and human resources of the Columbia River estuary area; and to improve communication and cooperation between member jurisdictions.
- 4.2 Technical Support: To provide technical support to member jurisdictions and, with the approval of the Council, to other groups, agencies, and individuals in the planning and review of development uses and activities proposed for location in the Columbia River estuary.

4.3 Plan Implementation: To assist member jurisdictions in effectively implementing and revising the estuarine and shoreland elements of local comprehensive plans developed from the Columbia River Estuary Regional Management Plan; and to reduce conflicts, uncertainties, and delays in local, state, and federal permit processes.

5. POWERS

CREST has the following authority:

5.1 Public Agreements: To enter into agreements with the United States of America, State of Oregon, State of Washington or any subdivision or agency of either, or any municipal corporation for the purpose of obtaining financial aid or other participation in attaining the objectives and purposes of CREST.

5.2 Private Agreements: To enter into contractual relationships with private agencies or firms.

5.3 Budget Adoption: To adopt a budget indicating the anticipated receipts and expenditures of CREST.

5.4 Bylaw Adoption: To make, adopt, and amend bylaws consistent with this Charter and Agreement.

6. STAFF

The Council shall appoint an Executive Director who shall administer the business of CREST. He shall employ such staff as the Council shall authorize.

7. DURATION AND TERMINATION

7.1 Dissolution: This Charter and Agreement shall continue and remain in full force and CREST shall not be dissolved unless by a majority vote of the member jurisdictions provided, however, that any such dissolution shall not become effective until such time as any contracts to which CREST is a party have been fully performed or are no longer in effect. In the event of such dissolution, all assets on hand shall be distributed to the member agencies in proportion to their contributions for the acquisition of such assets.

8. AMENDMENTS

This Charter and Agreement may be amended by a majority affirmative vote. Written notice of proposed amendments, must be submitted to each member at least 10 days prior to consideration.

4.3 Plan Implementation: To assist member jurisdictions in effectively implementing and revising the estuarine and shoreland elements of local comprehensive plans developed from the Columbia River Estuary Regional Management Plan; and to reduce conflicts, uncertainties, and delays in local, state, and federal permit processes.

5. POWERS

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8. AMENDMENTS

This Charter and Agreement may be amended by a majority affirmative vote of the council. Written notice of proposed amendments, must be submitted to each member at least 10 days prior to consideration.

APPENDIX B

OREGON GOAL EXCEPTIONS

Oregon Statewide Planning Goal 2 establishes a procedure local governments may use to take an exception. An exception is a decision to exclude certain land or water areas from one or more of the requirements of a particular statewide goal. Oregon Administrative Rule 660-04-000 through -035 establishes procedures and standards for an exception. The rule also establishes two different kinds of exceptions. All of the exceptions in this appendix are "Reasons" exceptions.

This appendix does not include the actual texts of the exceptions rule, or of any of the 18 exceptions summarized below. The following information is included:

Short description of the exception;  
Area covered by the exception;  
Goal requirement that the exception applies to;  
Date of adoption; and  
Adopting jurisdictions.

1. Pile-supported access in an Natural Aquatic area between North and South Tongue Point.

Mediation Panel Agreement area at Tongue Point.

Goal 16 Natural Management Unit requirements.

Astoria Ordinance 81-15, 81-16; November 15, 1981

City of Astoria; Clatsop County

2. Shoreline access structure connecting North and South Tongue Point

Mediation Panel Agreement area at Tongue Point.

Goal 16 Natural Management Unit requirements.

Astoria Ordinance 81-15, 81-16; November 25, 1981

City of Astoria; Clatsop County

3. Railroad access to South Tongue Point across a Natural Aquatic area.

Mediation Panel Agreement area at Tongue Point.

Goal 16 Natural Management Unit requirements.

Astoria Ordinance 81-15, 81-16; November 25, 1981

City of Astoria; Clatsop County

4. Five to six acres of Development Aquatic designation at South Tongue Point

Mediation Panel Agreement area at Tongue Point.

Goal 16 Natural Management Unit requirements.

Astoria Ordinance 81-15, 81-16; November 25, 1981

City of Astoria; Clatsop County

5. Construction of jocks in a Natural Aquatic area at South Tongue Point.

Mediation Panel Agreement area at Tongue Point.

Goal 16 Natural Management Unit requirements.



Astoria Ordinance 81-15, 81-16; November 25, 1981

City of Astoria; Clatsop County

6. Approximately 7.8 acre Development Aquatic designation in Alder Cove  
  
Mediation Panel Agreement site at the West Skipanon River Peninsula.  
  
Goal 16 Natural Management Unit requirements.  
  
August 5, 1981.  
  
City of Warrenton
  
7. Zone change from Aquatic Natural to Aquatic Conservation for about \_\_\_\_\_ acres.  
  
Mediation Panel Agreement area on the east Skipanon River peninsula.  
  
Goal 16 Natural Management Unit requirements.  
  
August 5, 1981.  
  
City of Warrenton
  
8. Aquatic Development designation for 25 acres of marsh.  
  
Mediation Panel Agreement area on the east Skipanon River peninsula.  
  
Goal 16 Natural Management Unit requirements.  
  
August 5, 1981.  
  
City of Warrenton.
  
9. Allows infilling of houseboats in an area committed to houseboat use, subject to sanitation, placement and lease requirements.  
  
John Day River  
  
Goal 16 Conservation Management Unit requirements.  
  
September 30, 1983.  
  
Clatsop County

10. Zone change from Forest-38 to Marine Industrial  
Bradwood  
Goal 4 requirements for designating forest lands.  
August 15, 1984  
Clatsop County
  
11. Allows fill at a certain site on the Lewis and Clark River for dike maintenance  
  
Diking District 5, near the Astoria Marine Construction Corp  
boatyard.  
  
Goal 16 Natural Management Unit requirements.  
July 6, 1983  
Clatsop County
  
12. Realignment of the Port of Astoria Dike.  
Port of Astoria Airport, northeast side.  
Goal 16 Natural Management Unit requirements.  
June 9, 1982.  
City of Warrenton
  
13. Allows dredging to obtain dike maintenance material  
Subtidal areas where road access is not available.  
Goal 16 Dredging requirements.  
  

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Clatsop County
  
14. Allows dredging to keep tidegates open. This exception is no longer needed: 1984 amendments to statewide planning Goal 16 allow this activity.  
  
In front of tidegates throughout Clatsop County.  
  
Goal 16 Dredging requirements.

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Clatsop County

15. Allows dredging in a small area for a barge moorage.

Tansy Point

Goal 16 Conservation Management Unit requirements.

March 25, 1987.

City of Warrenton

16. Allows beach nourishment at certain sites.

Sand Island, other sites.

Goal 16 Natural Management Unit requirements.

December 31, 1987

Clatsop County

APPENDIX C

DOCUMENTS INCORPORATED INTO THE PLAN  
BY REFERENCE

The following documents are incorporated in the Columbia River Estuary Regional Management Plan by reference:

- Architects Atelier/Northwest. 1977. Waterfront people places system. Astoria, OR: City of Astoria.
- Barnes, M. In Progress. Economic evaluation of the Columbia River Estuary. Astoria, OR: CREST.
- Bierly and Associates. 1981. Port of Ilwaco comprehensive marina plan. Ilwaco, WA: Port of Ilwaco.
- CREST. 1982. Columbia River Estuary resource base maps. Astoria, OR: CREST.
- CREST. 1981. Mediation panel agreement. Astoria, OR: CREST.
- Fox, D.S. 1986. Columbia River Estuary dredged material management plan. Astoria, OR: CREST.
- Fox, D.S. 1987. Dredging and dredged material disposal policy evaluation. Astoria, OR: CREST.
- Marshall, J. 1987. Columbia River Estuary mitigation and restoration plan. Astoria, OR: CREST.
- Perron, R. 1987. Skamokawa tourism facilities feasibility study. Cathlamet, WA: Lower Columbia Economic Development Council.
- Port of Astoria. 1985. Port of Astoria marine terminals development plan. Astoria, OR: Port of Astoria.
- Thomas, D.W.; Bell, S.J. 1983. changes in Columbia River Estuary habitat types over the past century. Astoria, OR: Columbia River Estuary Data Development Program.
- Thomas, D.W. 1982. Significant shoreland and wetland habitats in the Clatsop Plains and the Columbia floodplain of Clatsop County, Oregon. Astoria, OR: CREST.
- Waterfront Review Committee. 1986. Astoria waterfront revitalization plan. Astoria, OR: City of Astoria.

APPENDIX D

BIBLIOGRAPHY

- Bierly & Associates. 1981. Port of Ilwaco Comprehensive Marina Plan 1981. Ilwaco, WA: Port of Ilwaco.
- Bottom, D.; Jones, K.K; Herring, M.L. 1984. Fishes of the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Columbia River Estuary Data Development Program. 1984. Base map of the Columbia River Estuary (scales 1:50,000 and 1:12,000). Astoria, OR.
- Columbia River Estuary Study Taskforce. 1979. Columbia River Estuary inventory. Astoria, OR.
- CREST. 1982. Columbia River Estuary resource base maps. Astoria, OR: CREST.
- CREST. 1981. Mediation panel agreement. Astoria, OR: CREST.
- Dawley, E.M.; Ledgerwood, R.D.; Blahm, T.H.; Jensen, A.L. 1982. Migrational characteristics and survival of juvenile salmonids entering the Columbia River Estuary in 1981. Seattle, WA: NMFS.
- Dawley, E.M.; Sims, C.W.; Ledgerwood, R.D; Miller, D.R.; Thrower, F.P. 1979. A study to define the migrational characteristics of chinook and coho salmon and steelhead trout in the Columbia River Estuary, 1978 Annual Report. Seattle, WA: NMFS.
- Dunn, J.; Hockman, G.; Howerton, J.; Tabor, J. 1984. Key mammals of the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Durkin, J.T. 1977. Migration and timing of juvenile salmon. Paper presented at the American Institute of Research Fisheries Biologists, Ilwaco, WA.
- Durkin, J.T. 1982. Migrational characteristics of coho salmon (Oncorhynchus kisutch) smots in the Columbia River and its estuary. Kennedy, V.S., ed. Estuarine Comparisons. New York: Academic Press. pp. 365-376.
- EDAW, Inc.; CH<sub>2</sub>MHill. 1986. Aquaculture Siting Study. Olympia, Washington: Washington Department of Ecology.
- Ebel, W.J.; Durkin, J.T.; Blahm, T.; McCabe, G.; Coley, T.; McConnell, R.; Emmett, R.; Muir, W. 1981. Columbia River Estuary Data Development Program report: Salmonid and non-salmonid fish, 1981. Vancouver, WA: Pacific northwest River Basins Commission.
- Fisher, D.A.; Meslow, E.C.; Coykendall, J.R.; Herb, G.; Martinsen, F.; O'Neil, K. 1976. Columbian white-tailed deer recovery plan. U.S. Fish and Wildlife Service
- Fox, D.S.; Bell,S; Nehlsen, W; Damron, J. 1984. The Columbia River Estuary: atlas of physical and biological characteristics. Astoria,

- OR: Columbia River Estuary Data Development Program.
- Fox, D.S. 1986. Columbia River Estuary Dredged Material Management Plan. Astoria, Oregon: Columbia River Estuary Study Taskforce.
- Fox, D.S.; Benoit, P. 1986. Dredged Material Disposal at Area D. Astoria, Oregon: Columbia River Estuary Study Taskforce.
- Fox, D.S. 1987. Dredging and dredged material disposal policy evaluation. Astoria, OR: CREST.
- Fraser, M.B. 1978. Columbia River Estuary Marina Study. Astoria, Oregon. Columbia River Estuary Study Taskforce
- Frey, B.E.; Small, L.F.; Lara-Lara, R. 1984. Water column primary production in the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Gabrielson, I.W.; Jewett, S.G. 1970. Birds of the Pacific Northwest. New York: Dover Publications, Inc.
- Garret, M. 1985. Draft maps of Columbia River Estuary bald eagle nests and territories.
- Hamilton, P. 1984. Hydrodynamic Modeling of the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Hazel, C.R.; Ives, J.H.; Miller, K.J.; Edwards, D.K.; Tinling, J.S.; Dorsy, G.L.; Green, M.; Crawford, J.A. 1984. Avifauna of the Columbia River estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Higley, D.L.; Holton, R.L. 1978. A grab-sample study of the benthic invertebrates of the Columbia River Estuary. Corvallis, OR: Oregon State University.
- Holton, R.L.; Higley, D.L.; Zrezezinski, M.A.; Jones, K.K.; Wilson, S.L. 1984. Benthic infauna of the Columbia River estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Jay, D.A. 1983. Interim report: circulatory process in the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Jeffries, S.J.; Treacy, K.D.; Geiger, A.C. 1984. Marine mammals of the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Jones, K.K.; Bottom, D.L. 1984. Zooplankton and larval fishes of the Columbia River estuary. Astoria, OR: Columbia River estuary Data Development Program.
- Kujala, N. 1976. Biological characteristics of fish life and plankton. Draft report. Astoria, OR: Columbia River Estuary Study Taskforce.



- Land Conservation and Development Commission. 1985. Oregon's statewide planning goals. Salem, OR: Department of Land Conservation and Development.
- Macdonald, K.B.; Winfield, T.P. 1984. Tidal marsh plant production in Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Marshall, J. 1987. Columbia River Estuary mitigation and restoration plan. Astoria, OR: CREST.
- McIntire, C.D.; Amspoker, M.C. 1984. Benthic primary production in the Columbia River Estuary. Astoria, OR: Columbia River Estuary Data Development Program.
- Morgan, M. In progress. Clatsop County, Hammond, Warrenton, and Astoria public access plans. Cannon Beach, OR: Clatsop-Tillamook Intergovernmental Conference.
- Nature Conservancy. 1984. June 25, 1984, letter to the U.S. Army Corps of Engineers concerning coastal dune ecosystems on West Sand Island.
- Odgen Beeman and Associates, Inc.; Benkendorf Associates; Enviro Science, Inc. 1986. Lower Columbia River assessment of Oregon deep draft sites. Portland, OR: Department of Economic Development.
- Oregon Department of Transportation. 1975. Lower Columbia River ports region study. Salem, OR.
- Oregon Department of Transportation. 1983. Statewide Comprehensive Outdoor Recreation Plan (SCORP). Salem, Oregon.
- Oregon Division of State Lands. 1984. Estuarine mitigation, the Oregon process. Salem, OR.
- Oregon State Parks and Recreation Branch, Department of Transportation. 1976. Fort Stevens State Park Master Plan. Salem, Oregon.
- Oregon State University. 1974. Physical characteristics of the Youngs Bay estuarine environs. Corvallis, OR: Oregon State University Ocean Engineering Programs.
- Pacific Power and Light Company, Economic Development Department. 1985. Clatsop County Economic Development Assessment. Portland, Oregon: Pacific Power and Light.
- Pacific Power and Light Company, Economic Development Department. 1986. Target Industry Study - Northern Oregon Coast. Portland, Oregon: Pacific Power and Light.
- Perron, R. 1987. Skamokawa tourism facilities feasibility study.

- Cathlamet, WA: Lower Columbia Economic Development Council.
- Phillips Carter and Co., Inc.; Gordon Fay Associates, Inc.; Oregon Department of Transportation. 1986. Oregon coastal ports study. Portland, OR: Department of Economic Development.
- Port of Astoria. 1985. Port of Astoria marine terminals development plan. Astoria, OR: Port of Astoria.
- Roberson, J.A.; Copp, H.D.; Naik, B. 1980. Mathematical modeling of circulation in Baker Bay, Washington/Oregon. Pullman, WA: Washington State University, Department of Civil and Environmental Engineering.
- Schlicker, Herbert G., et al. 1972. Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon. Portland, Oregon: State of Oregon, Department of Geology and Mineral Industries.
- Science Applications International Corporation. 1986. Recommended Interim Guidelines for the Management of Salmon Net-Pen Culture in Puget Sound, Final Report. Olympia, Washington: Washington Department of Ecology.
- Simenstad, C.; Jay, D.; McIntire, C.D.; Nehlsen, W.; Sherwood, C.; Small, L. 1984. The dynamics of the Columbia River estuarine ecosystem, 2 vols. Astoria, OR: Columbia River Estuary Data Development Program.
- Sims, C.W. 1979. Migrational characteristics of juvenile fall chinook salmon, Oncorhynchus tshawytscha, in the Columbia River Estuary. Seattle, WA: NMFS.
- Sutherland, G.B. 1979. Oil spill protection plan for the natural resources of the lower Columbia and Willamette Rivers. Portland, OR: Oregon Department of Environmental Quality.
- Tabor, J.E. 1976. Inventory of riparian habitats and associated wildlife along the Columbia and Snake Rivers, vols. 2A and 2B. Corvallis, OR: Oregon Cooperative Wildlife Research Unit, Oregon State University.
- Thomas, D.W. 1982. Significant shoreland and wetland habitats in the Clatsop Plains and the Columbia floodplain of Clatsop County, Oregon. Astoria, OR: CREST.
- Thomas, D.W. 1980. Study of the intertidal vegetation of the Columbia River Estuary, July - September 1980. Vancouver, WA: Pacific Northwest River Basins Commission.
- U.S. Army Corps of Engineers. 1987. Baker Bay bathymetric differencing, draft report. Portland, OR.
- U.S. Army Corps of Engineers (Portland District). 1986. Clatsop

County, Oregon Diking Improvement District #9 Flood Damage Reduction Study: Draft Detailed Project Report and Environmental Assessment.

U.S. Army Corps of Engineers. 1987. Columbia River downstream of Bonneville Dam maintenance disposal plan. Portland, OR.

U.S. Fish and Wildlife Service. 1979. Concept plan for waterfowl wintering habitat preservation, Washington and Oregon coasts. Portland, OR.

U.S. Fish and Wildlife Service. 1986. Pacific Bald Eagle Recovery Plan. Portland, Oregon.

United States Department of Aquaculture, Soil Conservation Service. 1986. Soil Survey of Grays Harbor County Area, Pacific County and Wahkiakum County, Washington.

Wahkiakum County. 1987. Wahkiakum County overall economic development program. Cathlamet, WA.

Waterfront Review Committee. 1986. Astoria waterfront revitalization plan. Astoria, OR: City of Astoria.

Watson, J.W.; Anthony, R.G. 1986. Ecology of Bald Eagles in the Tongue Point area, lower Columbia River. Portland, OR: U.S. Army Corps of Engineers.

Wilson, S.L.; Jones, K.K.; Higley, D.L.; Holton, R.L. 1982. Seasonal changes in community structure of benthic infauna at six stations in the Columbia River Estuary. Corvallis, OR: State University, School of Oceanography.

APPENDIX E

PLAN REVISION PARTICIPATION

The following individuals attended plan revision advisory committee meetings or provided comments on draft plan material.

Citizens

Deanne Bruner, Astoria  
Howard Bruner, Astoria  
Dorothy Burkhard, Lewis and Clark  
Jack Burkhardt, Lewis and Clark  
Pirkko Carlson, Astoria  
William Carlson, Astoria  
Casey Cochran, Warrenton  
Samuel Cochran, Warrenton  
Chris Doumit, Cathlamet  
Charles Haglund, Svensen Island  
Marie Haglund, Svensen Island  
Marvin Holland, Cathlamet  
Gerry Johnson, Astoria  
Ruth Kaste, Wahkiakum County  
Ivan Larsen, Astoria  
Mark Laukkanen, Wahkiakum County  
Mark Linqvist, Cathlamet  
Ardell McPhail, Ilwaco  
Dennis O'Conner, Lewis and Clark  
Duane Ostling, Cathlamet  
Herb Palmberg, Warrenton  
Larry Quigley, Cathlamet  
Daniel Stephan, Wahkiakum County  
Elroy Svensen, Wahkiakum County  
Esther Svensen, Wahkiakum County  
LeRoy Wika, Cathlamet

State Agency Representatives

Oregon Department of Economic Development  
Greg Baker

Oregon Department of Environmental Quality  
Bruce Sutherland

Oregon Department of Fish and Wildlife  
Brent Forsberg  
Steven Stanley  
T. Edwin Cummings

Oregon Department of Land Conservation and Development  
Gail McEwen  
Patti Snow

Oregon Division of State Lands  
Ken Franklin  
Janet Neuman

State Agency Representatives cont.

Oregon State University Sea Grant/Extension  
Jim Bergeron

Washington Department of Ecology  
Randy Davis

Washington Department of Wildlife  
Will Nelson

Local Government Representatives

City of Astoria  
Paul Benoit

City of Warrenton  
Walter Camp  
George Cooper

Clatsop County  
Elizabeth Fox  
Curt Schneider

Clatsop Economic Development Committee  
Jim Hill  
Duncan Law

Hammond mooring Basin  
Jack Zimmerman

Port of Ilwaco  
Frank Heer  
Bob Petersen

Town of Hammond  
Stephanie Hampton

Wahkiakum Port District #1

Wahkiakum Port District #2  
Steve McClain

Federal Agency Representatives

National Marine Fisheries Service  
Robert Emmett  
David Miller  
Ed Murrell

Soil Conservation Service  
Don Leach

Federal Agency Representatives cont.

U.S. Army Corps of Engineers

Sheryl Carrubba

Patrick Keough

Thomas Morse

U.S. Fish and Wildlife Service

Nancy Ellifrit

Karen Ingels

David Sill

