GC
1021
.W2
W36
1983
1025 7590

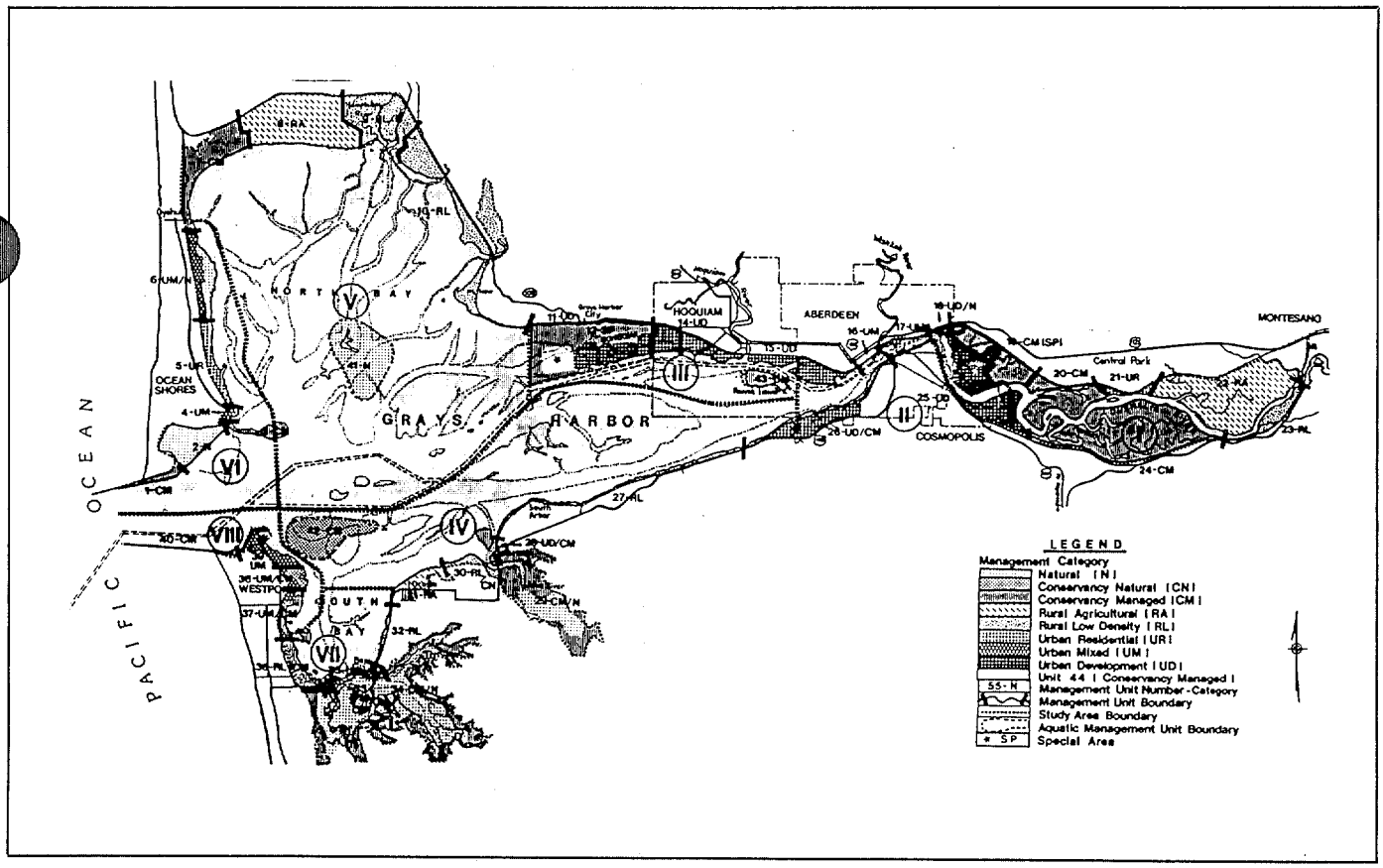
PROGRAM
DRAFT ENVIRONMENTAL IMPACT STATEMENT

WASHINGTON STATE COASTAL ZONE MANAGEMENT PROGRAM

Amendment No. 3
Approval of the

COASTAL ZONE
INFORMATION CENTER

GRAYS HARBOR ESTUARY MANAGEMENT PLAN

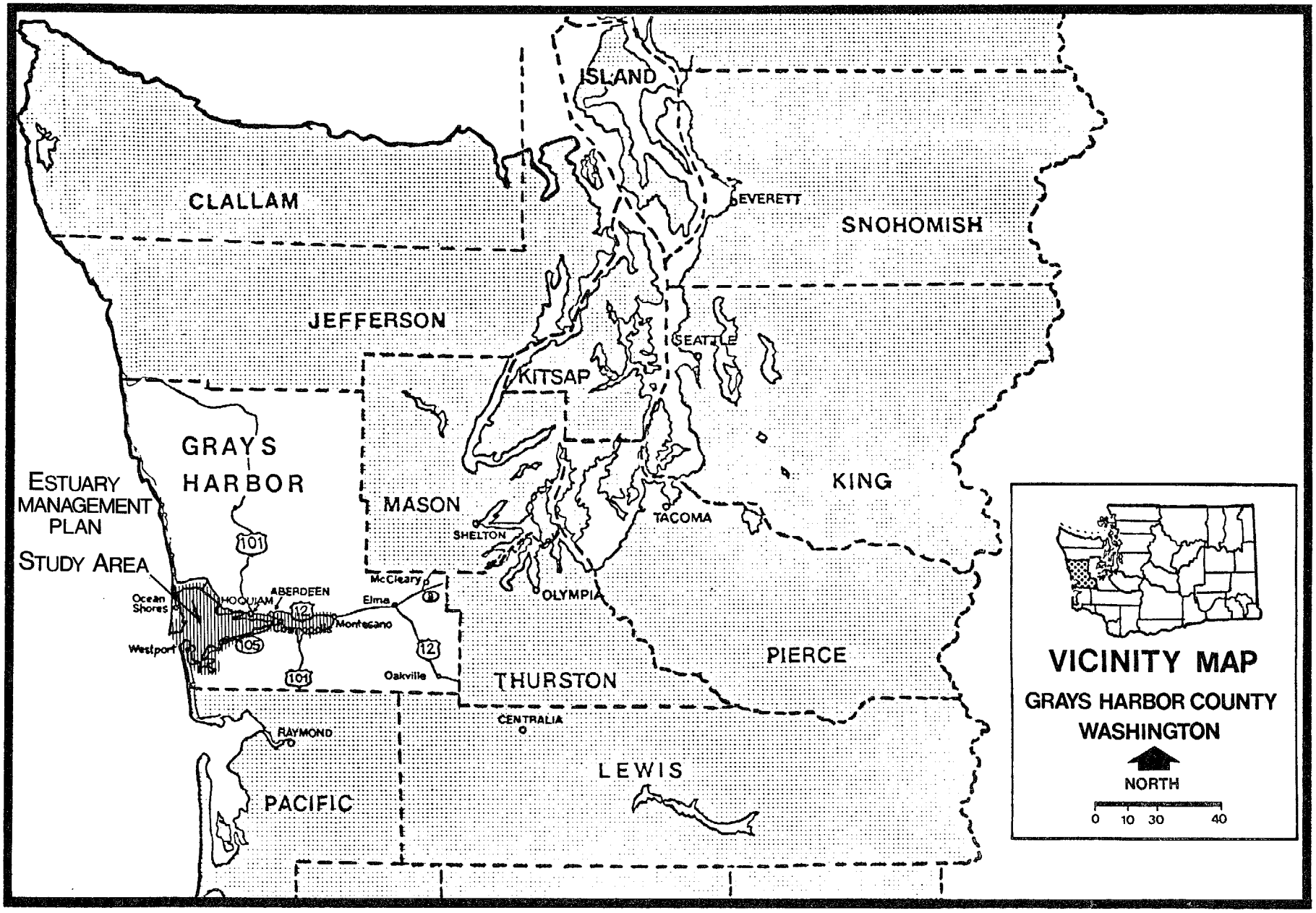


THE STATE OF WASHINGTON
Department of Ecology
and the
Grays Harbor Regional
Planning Commission

U. S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration/NOS
Office of Ocean and Coastal
Resource Management

U.S. National Oceanic & Atmospheric Administration
Office of Coastal Zone

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO


ISLAND
CLALLAM
EVERETT
SNOHOMISH
JEFFERSON
SEATTLE
KITSAP
GRAYS
HARBOR
ESTUARY
MANAGEMENT
PLAN
STUDY AREA
MASON
KING
TACOMA
SHELTON
101
McCleary
ABERDEEN
Ocean
Shores
HOQUIAM
12
Elma
OLYMPIA
Montesano
Westport
105
12
PIERCE
101
Oakville
THURSTON
CENTRALIA
RAYMOND
LEWIS
PACIFIC
VICINITY MAP
GRAYS HARBOR COUNTY
WASHINGTON
NORTH
0 10 30 40

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

July 27, 1983

COASTAL ZONE

INFORMATION CENTER

Dear Reviewer:

In accordance with the provisions of the National Environmental Policy Act of 1969, we enclose for your review our draft environmental impact statement on the Grays Harbor Estuary Management Plan. The proposed action is the third amendment to the Washington State Coastal Zone Management Program.

The Plan is a long-range, coordinated, comprehensive plan designed to guide future land and water use activities in the Grays Harbor estuary. It will be implemented through individual local Shoreline Master Programs and other ordinances and was developed by an intergovernmental agency task force.

Any written comments or questions you may have should be submitted to the responsible person identified below by October 4, 1983.

RESPONSIBLE PERSON

Mr. William Brah
Pacific Regional Manager
OCRM/NOAA: N/ORM3
3300 Whitehaven St., N.W.
Washington, D.C. 20235
(202/254-7100)

Thank you.

Sincerely,

Thomas E. Bigford for

Joyce M. Wood
Chief
Ecology and Conservation
Division

Enclosures

PLEASE TURN OVER

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Washington, D.C. 20230

OFFICE OF THE ADMINISTRATOR

MEMORANDUM

DATE: July 27, 1983

TO: Recipients of the Draft Environmental Impact Statement Prepared on the Grays Harbor Estuary Management Plan

FROM: JoAnn Chandler, Chief
Policy Coordination Division

SUBJECT: Public Hearing

You are invited to attend a public hearing to be held on the Draft Environmental Impact Statement prepared on the proposed Grays Harbor Estuary Management Plan.

The views of interested persons and organizations will be solicited. These may be expressed orally or in written statements. Presentations will be scheduled on a first-come, first serve basis, and may be limited to a maximum of 5 minutes, or as otherwise appropriate.

Parties unable to attend the scheduled public hearing may be assured that written comments submitted to the Office of Ocean and Coastal Resource Management, 3300 Whitehaven Street, N.W., Washington, D.C. 20235, by October 4, 1983, will receive the same consideration as oral comments presented at the public hearings.

The hearing will be held on Friday, September 16, 1983 from 2:00 to 5:00 pm and 7:00 to 10:00 pm at the following location:

Grays Harbor College Auditorium
Aberdeen, Washington

If you have any questions regarding the hearings please contact me at 202/634-4245 or Janet Richardson, Executive Director of the Grays Harbor Regional Planning Commission (Aberdeen, WA) at 206/532-8812.

ERRATA

Unfortunately there were some errors made during the printing of the DEIS which will cause some inconvenience to readers. Please note that the following pages are out of order: v, vi, vii, and viii. The pages currently are in the following order: iv, viii, vi, vii, ix, v. The page identifying the Grays Harbor Estuary Management Plan as Appendix A was not printed but readers will be able to easily distinguish the plan by the yellow pages. Also, Photograph C-4 on page C-19 was printed upside down.

DESIGNATION: PROGRAM DRAFT ENVIRONMENTAL IMPACT STATEMENT

TITLE: Washington State Coastal Zone Management Program Amendment No. 3: Approval and Adoption of the Grays Harbor Estuary Management Plan

ABSTRACT: The Grays Harbor Estuary Management Plan (plan) is a long-range, coordinated, comprehensive plan designed to guide future land and water use activities in Grays Harbor. It will be implemented through individual local Shoreline Master Programs under the Washington State Shoreline Management Act, other ordinances, and through various State and Federal regulations and permit actions. Grays Harbor estuary has been previously designated in the State Coastal Zone Management Program as an "area of particular concern" requiring special management attention. The focus of the plan is to define areas in which future activities and growth would be deemed acceptable while minimizing adverse impacts. Developed by an intergovernmental agency task force, the plan seeks to provide a balance between future development activities and the productive capacity of the estuarine system; minimize conflicts between resource users and regulators by enhancing the predictability of government permit decisions associated with the location of the future developments by taking agency requirements into account ahead of time; allow resource agencies to address cumulative effects of incremental permit proposals; and to provide appropriate mitigation or reduction of adverse development impacts.

This PDEIS describes the impacts associated with approval of the plan's recommendations and its implementation. Adverse impacts include potentially allowing the filling of up to an estimated 700 acres of aquatic habitat (or 1.2% of the estuarine environment) and the committing of specified areas to urban uses with related modification to shoreline features. Beneficial impacts include greater protection and enhancement of large areas of the shoreline and estuarine environment, protection of the regional economic base and the potential for future economic development, improved transportation systems and others associated with orderly land development.

COASTAL ZONE INFORMATION CENTER

APPLICANT: Washington State Department of Ecology
Olympia, Washington

LOCATION: Grays Harbor County, Washington (see map opposite page)

LEAD AGENCY: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Office of Ocean and Coastal Resource Management

COOPERATING AGENCIES: U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
National Marine Fisheries Service
Grays Harbor Regional Planning Commission*

Title Page Continued.

CONTACT: Mr. William Brah, Pacific Regional Manager
Office of Ocean and Coastal Resource Management
3300 Whitehaven Street, N.W.
Washington, D.C. 20235
(tele. 202/254-7100)

*The Grays Harbor Regional Planning Commission has lead agency responsibility under the Washington State Environmental Policy Act (SEPA). This Federal EIS is intended to satisfy the requirements of SEPA. Contributions in the preparation of the EIS from the Regional Planning Commission are gratefully acknowledged.

NOTE TO REVIEWERS

1. Attachment I - Data Maps Supplement, will be distributed on a one-time basis only.

2. The Program Final Environmental Impact Statement (PFEIS) will be distributed only to parties who comment on this Program Draft Environmental Impact Statement (PDEIS) or who specifically request a copy during the public review period.

3. During 1980, the Coastal Zone Management Act (CZMA) was amended to include the recognition and encouragement of a relatively new type of planning and management tool known as "special area management planning" (SAMP). Realizing that there are intense conflicts surrounding the utilization and preservation of some coastal resources more than others, Congress declared a national policy to: "encourage the preparation of special area management plans which provide for increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, and improved predictability in governmental decisionmaking;" (§303(3)).

   GHEMP is one form of a SAMP and ever since the planning process started in 1976, OCRM has received a number of expressions of interest in the planning and management process because of intense conflicts needing resolution.

   For those individuals who care to take the time, OCRM is interested in their comments and opinions on SAMP's in general and/or on the GHEMP process. For instance, commenters might consider:

   - Does the GHEMP process which involved Federal, State and local government representatives planning in advance and making general decisions on the future use of the resources prior to applications for specific projects represent a useful approach to SAMP consistent with the CZMA directive?

   - What other innovative planning and management techniques to solve complex resource development/preservation conflicts should OCRM and the States be developing as types of special area management planning?

   Your comments will be appreciated, carefully evaluated and will assist us in the future conduct of our activities and assistance to the States. You may submit your comments separately or in conjunction with your comments on this environmental impact statement.

TABLE OF CONTENTS

SUMMARY

A. Background i
B. Proposed GHEMP ii
C. Areas of Controversy ix
D. Issues to be Resolved xiii
E. Major Conclusions xiv
F. Future Actions xviii

Part I. PURPOSE AND NEED FOR ACTION

A. General I-1
B. Program EIS I-1
C. Nature of the Action I-2
D. Need for the GHEMP I-6

Part II. ALTERNATIVES INCLUDING THE PROPOSED ACTION

A. General II-1
B. The Proposed Action II-2
C. No Action II-14
D. Alternative Plan Concepts II-20
1. Greater development opportunity/less resource protection II-20
2. Less development opportunity/greater resource protection II-22
3. Disperse development II-31
4. Concentrate development II-32
5. Locate industrial areas away from estuary II-34
a. Non-estuarine areas II-34
b. Other sites in estuary II-35
c. Other ports II-37
E. Urban Management Unit Designations II-44
F. Means of Implementation II-73
G. Mitigation II-77

Part III. AFFECTED ENVIRONMENT

A. General Setting III-1
B. Use of Inventory Data in Planning Process III-2
C. Physical Environment III-4
D. Biological Environment III-9
E. Socioeconomic Environment III-26

Part IV. ENVIRONMENTAL CONSEQUENCES

A. Introduction IV-1
B. Elements of the Physical Environment IV-1
C. Elements of the Biological Environment IV-7
D. Elements of the Human Environment IV-20
E. Impact Evaluation of Planning Alternatives IV-25
F. Cumulative Impacts IV-36
G. Relationship Between Short-Term Uses and Long-Term Productivity IV-42

H. Unavoidable Adverse Impacts IV-44
I. Irreversible and Irretrievable Commitment of Resources IV-44
J. Relationship to Existing Land Use Plans, Zoning and Regulations IV-46

Part V. MISCELLANEOUS

A. List of Preparers V-1
B. List of Agencies, Organizations and Individuals Receiving a Copy of the PDEIS V-2
C. Appendix
  A. GRAYS HARBOR ESTUARY MANAGEMENT PLAN
  B. Federal Agency Letters of Intent
  C. Management Unit 12 - Bowerman Basin Impacts
  D. Various Articles on the GHEMP process
  E. Excerpts from the Federal Coastal Program Review
  F. The Citizen's Grays Harbor Estuary Management Plan
  G. Use and Development of the Urban Waterfront from "Revitalization Potentials on the Grays Harbor Urban Waterfront," GHRPC, Nov. 1981
  H. List of Technical Team Members and Individuals Interviewed
  I. Species List

D. Attachment 1 - Data Maps Supplement
  Map 1. Existing Land Use
  " 2. Land Ownership
  " 3. Jurisdiction and Boundaries/Historical
  " 4. Land and Water Transportation
  " 5. Major Utilities
  " 6. Hydrology and Floodplain
  " 7. Soils and Sediments
  " 8. Vegetation/Wildlife
  " 9. Fisheries
  " 10. Natural Resource Use

LIST OF TABLES

1. Breakdown of Management Unit Designations.....II-3
2. Estimated Waterfront in Generalized Conservation & Development Categories.....II-4
3. Characteristic Species of Major Vegetation Types of Grays Harbor Estuary.....III-10
4. Organic Carbon Contributions of Various Sources Within the Estuary.....III-12
5. Estimated Extent of Intertidal Habitats in Grays Harbor.....III-14
6. Populations of Incorporated Communities Around Grays Harbor.....III-26
7. Population Projections: 1990.....III-27
8. Timberland Ownership - Public/Private.....III-27
9. Average Annual Unemployment Grays Harbor/Washington/Nation.....III-28
10. Potential Loss of Aquatic Areas Which Would Be Impacted By Future Projects.....IV-8
11. Habitat Types Depicted in Figure 25.....IV-12
12. Bird Habitats Protected by GHEMP.....IV-16
13. List of Birds Associated With Freshwater Shrub Swamp or Marsh Habitats.....IV-17
14. Mammals Found in Six Grays Harbor Habitats.....IV-19

LIST OF PHOTOGRAPHS

1. Aerial View of Management Unit 12.....xi
2. Rennie Island.....II-33
3. Port of Grays Harbor Shipping Terminal.....II-42
4. Bayside View of Ocean Shores.....II-45
5. Ocean Shores Existing Air Terminal and Proposed New Terminal Site.....II-47
6. Management Unit 12.....II-49
7. Management Unit 12.....II-50
8. Management Units 14, 15 and 43.....II-56
9. Management Units 18, 19 and 20.....II-60
10. Management Unit 21.....II-61
11. Management Unit 25.....II-63
12. Management Unit 26.....II-66
13. Management Units 33, 34 and 35.....II-68
14. Management Unit 38 - Westport Airport.....II-70

LIST OF FIGURES

1. Planning Areas-Character, Major Uses, Conflicts, Assets.....iv, v
2. Standard Uses Matrix.....vi
3. Permitted Activities Matrix.....vi
4. Shorefronts in Generalized Conservation or Development Categories.....II-5
5. Consolidated Permitted Activities Matrix.....II-7
6. Comparison of Existing Local Shoreline Master Program's and GHEMP.....II-18
7. Port Study Regions.....II-38
8. April 1978 Draft GHEMP Proposed Alternative for MU 12.....II-53
9. Aberdeen Riverfront Marina Park.....II-58
10. Schematic of MU 26 Proposed South Shore Fill Site.....II-64
11. Westport Marina.....II-72
12. Potential Mitigation Sites.....II-78
13. Chehalis Drainage Basin.....III-5
14. Salinity Averages.....III-5
15. Nomenclature of Navigation Channel.....III-6
16. Wetland Vegetation of Grays Harbor.....III-13
17. Significant Bird Habitats.....III-17
18. Life History Stages and Range and Peaks of Chinook, Chum and Coho Salmon in Grays Harbor.....III-18
19. Life History Stages and Range and Peaks of Steelhead, Cutthroat and Sturgeon in Grays Harbor.....III-18
20. Life History Stages and Range and Peaks of Shad, Flounder and Shellfish in Grays Harbor.....III-19
21. Outmigration Periods for Selected Salmon and Trout.....III-19
22. Predators of Corophium salmonis.....III-22
23. Map Depicting Non-Consumptive Resource Use.....III-29
24. Schematic of Grays Harbor Food Web.....IV-10
25. Land Use Cover Map of MU's 18 & 25.....IV-11
26. Identified Sites of Archeological Significance.....IV-24
27. Summary of Natural, Social and Economic Impacts of Planning Alternatives.....IV-26
28. No Action Alternative Map.....IV-27
29. GHEMP Alternative Map.....IV-28
30. Less Development Alternative Map.....IV-29
31. Greater Development Alternative Map.....IV-30
32. Dispersed Development Alternative Map.....IV-31
33. Concetrate Development Alternative Map.....IV-32
34. Extent of Intense Urban & Residential Development Map.....IV-37
35. Planning Areas and MU's Showing Extent of Potential Land and Water Use Activities.....IV-38
36. Consolidated Permitted Activities Matrix.....IV-39
37. Major Wetlands Which Will Be Impacted.....IV-40

SUMMARY

A. BACKGROUND

On June 1, 1976, the Office of Ocean and Coastal Resource Management (OCRM) approved the Washington State Coastal Zone Management (WSCZM) Program as complying with the requirements of the Coastal Zone Management Act (CZMA). The State of Washington Department of Ecology (DOE) as part of its WCZMP identified the Grays Harbor Estuary as being an "area of particular concern" and in need of further planning and management.[1] In September 1976 the Grays Harbor Regional Planning Commission (GHRPC) received funds from the DOE for the development of the Grays Harbor Estuary Management Plan (GHEMP or plan).

The governmental responsibility for making decisions about the use of the land and water resources of the Grays Harbor area falls to a wide variety of local, State, and Federal agencies. This array of authority lacking a common information and policy base had led to confusion, uncertainty, and frustration for individuals and organizations seeking to carry out their responsibilities or commenting on an activity in the estuary.[2]

In recognition of these conflicts and variety of authorities, the GHRPC formed a special advisory Task Force consisting of representatives from those local, State, and Federal government agencies with authority to decide on land and water uses, including Grays Harbor County; the cities of Aberdeen, Hoquiam, Ocean Shores, Westport and Cosmopolis; the Port of Grays Harbor; Washington State Departments of Ecology, Game, Fisheries and Natural Resources; Environmental Protection Agency; Fish and Wildlife Service; and the National Marine Fisheries Service. The Army Corps of Engineers was not an official member of of the Task Force but did provide technical assistance throughout the planning process. A consultant team was retained to assist in developing the plan.

A five-step planning process was initiated including the assembly of a comprehensive resource data base, development of the plan through alternatives analysis and consensus decisionmaking, two separate steps involving the review and revision of draft plans, and finally adoption of the plan by the Estuary Task Force. The Task Force will approve the plan after all comments from the public have been received, evaluated, responded to and final changes made. This action in and of itself has no legal standing since the Task Force is an advisory body. The GHRPC will then submit the GHEMP to participating local governments for consideration of revising their existing local Shoreline Master Programs (SMP's) and implementing ordinances as appropriate. Once approved, the local governments will submit their amendments to the DOE for State approval. Additional public hearings will be held by both the local governments and the DOE in accordance with established rules and regulations. After DOE approval, OCRM will review the GHEMP for incorporation as an amendment to the existing WCZMP and make Findings of Approvability if appropriate, at which time Federal consistency under Section 307 of the CZMA will apply to future Federal actions in Grays Harbor.

---

1. Office of Coastal Zone Management, NOAA, Final Environmental Impact Statement - State of Washington Coastal Zone Management Program, April 9, 1976.
2. For further background information see Part I, Section D-Need, Appendix D; and GHEMP, p.1, "Why the Plan?"

B. GRAYS HARBOR ESTUARY MANAGEMENT PLAN

The GHEMP is a management framework to guide future decisions related to the use of the estuary, striking a balance between the human use of the estuary to meet the region's social and economic needs, and the need to conserve and protect the long-term productive capacity of the estuarine ecosystem and its related recreational and natural values. But it does more than attempt to accommodate environmental, biological, commercial, industrial, sport and other demands without sacrificing the viability of any of them. One of its major purposes is its attempt to minimize potential conflicts between development interests and resource protection agencies and provide a measure of predictability to development interests, environmental interests and State and Federal resource agencies. By protecting the natural resource base, minimizing conflicts between users, and providing some degree of predictability, it is hoped that the plan will serve the total spectrum of the public interest in utilizing and maintaining a valuable ecosystem.

The proposed GHEMP is included in appendix A in its entirety. A summary of the proposed plan follows, as a description of the proposed action.

1. Summary of the GHEMP

a. Planning and Management Framework

(1). The GHEMP is based on the assumption that adequate guidance to property owners and government decisionmakers can only be provided by agreed upon detailed policies. The plan establishes, therefore, three levels of policies to guide land use and development activity with increasing degrees of specificity.

(2). The first policy level is the overall goal to "manage the estuary for the multiple uses which it can provide." Types of uses include port facilities, manufacturing, transportation, food industry, commercial, recreation, residential, agricultural and natural areas. The plan attempts to accommodate each of these diverse uses in a practical and environmentally sound way.

(3). The second level broadly categorizes uses of land and water into eight Planning Areas based on a common set of natural and man-related features including land ownership, political jurisdictions, existing uses, areas of existing or possible conflict, and physical boundaries or features. The Planning Areas provide a basis for describing how different areas of the estuary function and how they might function in the future. Each Planning Area is described in terms of its existing character, its major committed uses, its conflicts and assets, and includes planning guidelines for the future use of the area. A summary of the Planning Areas is contained in figure 1.

(4). The third level of policy in the plan, the Management Unit (MU), is the most specific level and is designed to give guidance to property owners and government agencies in evaluating project proposals. The plan establishes forty-three MU's classified into the following categories:

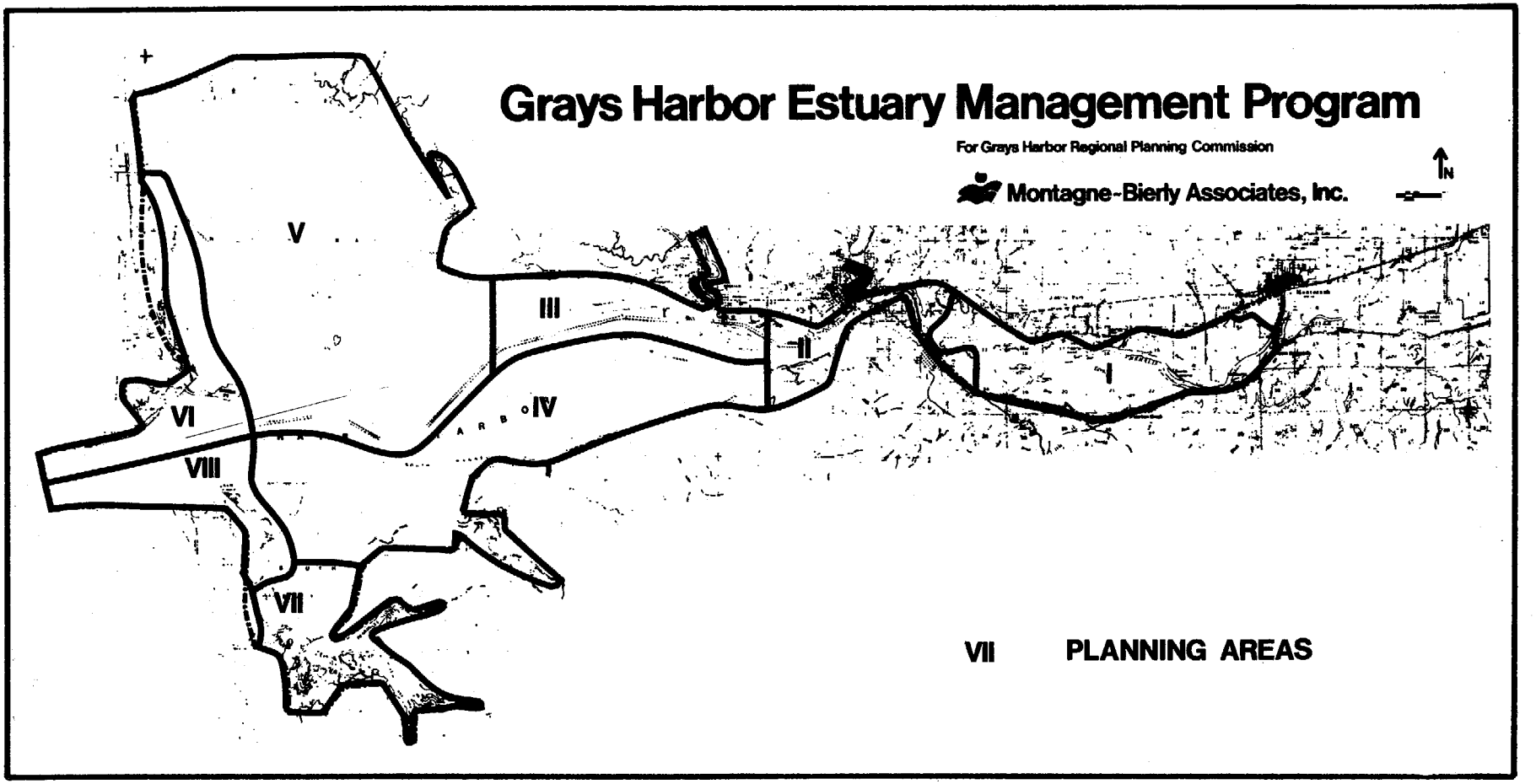
- Natural (N): to preserve and/or restore natural areas,
- Conservancy Natural (CN): to preserve and restore or enhance areas to their natural condition,
- Conservancy Managed (CM): to protect an area for uses that depend on natural systems,
- Rural Agricultural (RA): to protect existing and potential agricultural lands from urban expansion,
- Rural Low Intensity (RL): to restrict intensive development along undeveloped banklines and maintain open spaces,
- Urban Residential (UR): to protect areas in which the predominant use is or should be residential,
- Urban Mixed (UM): areas in which there is or should be a mix of compatible urban uses,
- Urban Development (UD): areas in which predominant uses are or will be industrial and commercial development, and
- Special (SP): areas where non-standard conditions exist either in the unit's boundary definition or where other special circumstances are present.

(5). In general, most of the estuary is designated in categories which constitute little change from existing conditions. Most of the water, intertidal and marsh area in the estuary is designated in Natural or Conservancy environments and most of the uplands are designated in Rural environments. The Urban environments, allowing more intensive uses, are generally associated with or are in proximity to areas currently containing intensive uses. While focusing the more intensive uses toward existing urban areas, the plan allows for some expansion into adjacent areas.

(6). In some cases, MU's have been split to afford additional protection to critical wetland values. A standard use matrix for each category of MU in the plan (see figure 2) identifies the permitted uses (a use or activity that conforms with the plan and may be undertaken subject to applicable permit requirements and policies and standards of the plan), conditional uses (for definition see GHEMP p. 17), and uses subject to special conditions for each classification category.

(7). For each MU the plan also identifies activities (dredging, filling, erosion control, water structures, etc.) which may be allowed by permit or otherwise regulated through a permitted activities matrix for each MU. Generally, the term "activities" addresses those actions which modify the physical character of the shoreline, in contrast to the term "uses" which refers to land use practices. Consequently, a given use (heavy industry, shipping, residential, etc.) as regulated by the MU category (e.g. UD), may or may not be permitted to engage in various activities (dredging, filling, erosion control, placing structures in water, etc.) because of the limitations placed on the uses in the activities matrix for that MU (see figure 3 and GHEMP pp. 6-9, HOW TO USE THIS PLAN).

Figure 1



Area	Character	Major Uses	Conflicts	Assets
I	The predominant character of Planning Area I is natural, largely influenced by the fresh water system of Chehalis River. It is an area of limited access and sparse development.	The predominant use of the planning area is for hunting, fishing, and wildlife observation. Secondary committed uses include the gravel extraction operations and agricultural uses in the upriver portions of the planning area.	No major conflicts exist within the planning area. Potential conflicts exist with industrial development pressures in the Junction City area and with possible development proposals for the many small parcels in the area. Such proposals would conflict with the predominant character and use of the area. The continued operation of the gravel extraction facility does not pose a major conflict.	The planning area is important as a water containment area, operating as a storage area for flood waters from up-river as well as tidal surging. In accommodating this hydrologic function, it serves as a valuable area for water fowl nesting and for recreation hunting and observation. The river corridor is a necessary area for fish passage and rearing.

b. Neither the plan nor agency commitment is intended to circumvent any permit authority, existing regulations, or public interest review; nor does it eliminate any of the criteria that an agency must use in evaluating a specific permit request (see GHEMP, pp 4-5, "Relationship to Local, State and Federal Permit Processes"). Rather, the plan integrates as much as possible the various requirements and responsibilities into the future uses and activities envisioned by the plan. Therefore, it is believed that the plan can answer some of the most difficult questions often asked during permit decisions affecting development projects within shoreline areas. For instance, under the 404(b)(1) Guidelines which must be met before a 404 permit can be issued, the very important issues regarding the practicable alternatives to the discharge of dredged or fill materials on the aquatic ecosystem, water dependency and producing the least adverse impacts can perhaps best be answered through collaborative (intergovernmental) comprehensive planning of which GHEMP is a product. The fact that these questions can be answered in part or in whole ahead of time for major future projects should alleviate many of the problems encountered in planning for development and in permit processing. The Task Force attempted to do this for several projects which were considered during the planning process. In some cases a great deal of time may be saved in permit processing which may benefit all concerned.

3. Impacts

a. It was the purpose of the Task Force to provide a comprehensive plan which would provide long-term environmental benefits as well as economic and social benefits over and above what the existing local SMP's provided. Large areas of the estuarine system are designated to conserve and protect their natural productive capacity, including the majority of the estuary's intertidal and submerged areas not utilized for navigation, a large marsh area upstream of Junction City and Cosmopolis, all of the Elk River Estuary, existing game management areas (Humptulips Delta, Johns River, and Oyehut), and specially designated areas intended to limit designated development areas in the vicinity of south Aberdeen, Ocean Shores Airport, and the Bowerman industrial area. Of particular importance is the "fish base" located in MU 14 and the "fish passage" which is important for migratory fish to pass through the urban areas of Aberdeen and Hoquiam.

b. A major trade-off provides the potential of up to 500 acres of fill (through phased development) for future port expansion and economic development while providing permanent protection to 1700 acres of aquatic habitat in MU 12. MU 12 has been identified as a significant habitat for migratory shorebirds and peregrine falcons. Filling of the wetlands over the years will have a significant adverse environmental impact on that habitat but, in the collective judgment of the Task Force including the Federal agencies, not an unacceptable one within the context of the entire ecosystem. For a definition of "unacceptable" see GHEMP p. 20. The U.S. Fish and Wildlife Service has made a finding that the proposed fill configuration would not jeopardize the continued existence of the peregrine falcons, and various mitigation and monitoring requirements are intended to increase the certainty that the peregrine falcons' continued existence will not be jeopardized.

Figure 2

STANDARD USES

● PERMITTED USE

□ SEE SPECIFIC MANAGEMENT UNIT GUIDELINES

	USE CATEGORY	NATURAL	CONSERVANCY		RURAL		URBAN			MANAGEMENT UNIT NO. 44
		N	CN	CM	RL	RA	UR	UD	UM	CM
PORT FACILITIES	Dock and Warehouse Facilities						□	●	●	□
	Port Terminal Facilities							●	□	□
	Ship Berthing							●	□	□
	Barge Berthing							●	□	□
	Ship Construction and Repair							●	□	□
	Navigational Aids	□	□	●	●	●	●	●	●	□
MANUFACTURING AND OTHER	Heavy Industry							●	□	
	Light Industry						□	●	●	
	Water Dependent Industry						□	●	●	□
	Forest Products Processing							●	□	
	Mineral Extraction and Storage			□	●	●		●	□	□
TRANSPORTATION	Ferry Terminal			□	●	●	●	●	●	□
	Shipping				●	●	●	●	□	□
	Roads and Railroads		□	□	●	●	●	●	●	
	Airports				□	□	□	●	●	
	Overhead Utility Corridor		□	□	●	●	●	●	●	□
	Submerged Utility Corridor		□	□	□	□	●	●	●	□
FOOD INDUSTRY	Commercial Fishing (Incl. Shellfish)	□	●	●	□	□				□
	Oyster Culture	□	●	●	□	□				□
	Aquaculture	□	●	●	□	□		●	●	□
	Fish and Food Processing			□	□	□	□	●	●	□
COMMERCIAL	Motel						●		●	
	Boat Sales, Construction and Repair						●	●	●	□
	Restaurant				●	□	●		●	
	Marina				□		●	●	●	□
	Other Commercial						□		●	
RECREATION	Public Fishing Areas	●	●	●	●	●	●	●	●	□
	Water Dependent Hunting	●	●	●	●	●				□
	Pleasure Boating	●	●	●	●	●	●	●	●	□
	Camping		□	●	●	□	□		□	
	Public Boat Ramp		□	●	●	□	●	●	●	□
	Park/Parkway, Other Public Access			□	●	□	●	●	●	□
RESIDENTIAL	Floating Homes						□		□	□
	Urban/Suburban						●		●	
	Rural Low Intensity (Scattered)			□	●	□	●			
	Rural Agricultural (Farm House)			●	□	●				
AGRICULTURE	Major Cultivated Crops					●				
	Passive Agriculture			●	●	●				
	Subsistence/Local Market Farming		□	●	●	●				
	Tree Farm		□	●	●	●				
NATURAL AREAS	Estuarine and Marine Sanctuaries	●								□
	Wildlife Refuges	●	●	●	●					□
	Living Resource Production and Habitat	●	●	●	●	●	●	●	●	□

Figure 3

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	CM
STRUCTURES	Piers, Docks, Wharves	●	*
	Piling & Mooring Dolphins	*	*
	Bridges	●	●
	Causeways	●	
	Outfalls	●	●
	Cable/Pipeline Crossing	●	●
	Boathouses		
	Breakwater		
BANK	Diking	●	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control	□	□
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●

CONDITIONAL ACTIVITY □

SPECIAL CONDITIONS *

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 26
PLANNING AREA II/IV

Management Category

UD/CM - Urban Development/Conservancy Managed

Boundary Description

Eastern Boundary - Management Unit 25
Western Boundary - the east bank of Chapin Creek.
Split Unit Boundary - the Burlington Northern Railroad line.
Study Area Boundary - the Burlington Northern Railroad line westerly to the line between Sections 16 and 17, T17N, R9W, thence southerly to the Westport Highway, following the highway west to the western management unit boundary.

Management Objectives

This is a particularly critical management unit in that it represents one of the future new industrial areas and yet contains critical vegetation to upriver fish migration and feeding. Additionally, two upland creeks with significant adjacent habitat traverse the area. Preservation of both features is the key to future use of this area.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions also apply:

1. On the landward side of the railroad line, heavy industrial development will be permitted consistent with the standard uses for the Urban Development classification. In the development of those areas, the riparian vegetation along Charley and Newskah Creek will be preserved (see also Conditions 6 and 7 below).

2. On the water side of the railroad line, limited development of inwater structures will be permitted in direct support of development within the Urban Development area.

3. Also within the Conservancy Managed area, on the water side of the railroad line, the existing treatment ponds and the Saginaw Mill site will be permitted to continue as will maintenance of the bankline of the treatment ponds and railroad line.

(8). In addition to the use matrix and the activities matrix, some MU's have special circumstances identified which would require the application of special conditions. Most major projects and activities (i.e., MU 6 - Ocean Shore Airport, MU 12 - Bowerman industrial development) are identified in the plan through these special conditions.

b. Other Provisions of the Plan

(1). In addition to the overall policy organization, the plan contains features which provide the ability to anticipate, guide, or meet future conditions.

(2). An annual and every fifth year review process is included in the plan. The Task Force evaluates the plan's ability to address circumstances that have occurred during the previous period using this review process. In establishing this procedure, the Task Force recognized that it could not foresee nor test all possible situations. While the plan represents the best judgment of the Task Force in achieving a balance for the estuary, only time and experience can provide the true test of that judgment.

(3). By this review process, amendments to the plan, initiated either as a result of the Task Force review process or through the request of an individual, group, or agencies, are possible. In addition to procedural requirements, the plan establishes three criteria that, if satisfied, could warrant such an amendment. These criteria specify that (a) any amendment must be consistent with the overall goal of the plan and with other applicable general guidelines and policies, (b) the amendment will not cause adverse effects that cannot be mitigated, and (c) that there are adequate facilities or services to support the activity or activities specified in the amendment.

(4). At one time, the planning and management framework of the plan was for a 50-year period which corresponded to the commitment to set aside 1700 acres of Port of Grays Harbor owned land in MU 12 for this period of time. Now, however, the commitment is for permanent transfer and therefore, the timeframe is basically for an indefinite period of time.

2. Plan Implementation

a. In order for the plan to be a useful management tool, each State and Federal agency will utilize the applicable portions of the plan in implementing its policy, permit review criteria, and procedures; and local governments through adoption in local Shoreline Master Programs, comprehensive plans, and zoning designations. Participation by regional or district offices of the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be acknowledged through signed Letters of Intent (LOI) in which they will set forth the role the GHEMP will play in their future decisionmaking on activities consistent or inconsistent with the plan as well as the nature and degree of their commitment to the plan (see appendix B).

c. Development is directed toward existing developed areas. Heavy industry focuses around the filled or upland areas of Aberdeen, Hoquiam, and Cosmopolis with exceptions in the Bowerman industrial area, in the southeast corner of Aberdeen, and on the shore of the inner harbor. A limited amount of new fill would be permitted adjacent to the existing industrial areas in Junction City and Cosmopolis. There would be some expansion to the existing boat basins for marine commercial uses. Waterfront commercial uses could locate on the Aberdeen waterfront; intensive residential uses would be permitted only in limited upland areas along the shoreline in Ocean Shores, Westport, Old Aberdeen Waterfront and Central Park, with the rest of the shoreline limited to low intensity agricultural, forest, resource production and residential uses consistent with existing character and use.

d. The plan permits uses which are already allowable under the existing local Shoreline Master Programs (e.g., bankline straightening, fill, erosion control, residential development, etc.), but does so in a manner which is generally acceptable to all parties on the Task Force by redesignating MU's and tailoring permissible/conditional uses allowed within those MU's (e.g. activities such as jetties or groins, which are permitted in urban environments under the existing SMA's, are not permitted in all urban MU's under GHEMP).

e. The plan will help address the difficult issue of determining cumulative impacts of future projects. By knowing the amount and probable location of future development, a better evaluation of the full impact of future development on the estuary can be made.

4. Alternatives

a. This EIS discusses practical alternatives to the proposed action including no action (or status quo), various plan provisions which would provide greater or lesser development, concentrating or dispersing development, alternate port and industrial site locations, alternatives to specific MU designations and alternative methods of implementation. In addition, during the scoping process OCRM received a Citizen's Grays Harbor Estuary Management Plan as an alternative to the proposed plan for consideration; it is included under the "Less Development and Greater Resource Protection" section.

b. The alternatives analysis does not extend to considering different permitted activities and standard uses in individual MU's. The matrixes identifying these uses were extensively considered by the Task Force members, and alternatives fully considered but limited or eliminated in part because of the consensus decisionmaking process. The analysis of overall alternative provisions of the plan, such as greater or lesser development, is reflected in general consideration of various use schemes. For purposes of this public review, uses and activities identified by the plan within specific MU's are still open for consideration. Those comments will be evaluated; if a significant impact not otherwise analyzed is identified, the final PEIS will be expanded to consider that alternative. Additionally, the plan cannot address all possible alternatives to individual actions so specific alternatives analyses may be required for specific proposals during permit processing.

C. AREAS OF CONTROVERSY

The GHEMP was developed to solve problems surrounding land and water uses of the estuary, especially tension between accommodating economic growth which might require fill of wetlands and assuring the long-term preservation of a

II	Planning Area II is a high intensity, urban area with a mix of industrial, commercial and marine uses. Although some heavy industry is present, the mix of uses is more oriented to urban commercial than to heavy industry. Much of the character of the planning area is a result of the convergence of highway, rail and water transportation systems.	In addition to existing industrial, urban commercial and marine uses, the planning area is also an important fish passage area to upriver feeding, spawning and rearing areas; it provides commercial fishery for migrating fish; some water fowl nesting areas exist in the southwestern portions; log storage areas and industrial waste discharge occur within this area; and major regional and north and south estuary linkages exist in the planning area.	Primary conflicts occur as a result of the demands of urban development and the needs of the water system to support fish passage.. As the focal point for development and transportation, high demands are placed on the water system and thereby the quality of the water. As the focal point for fish migration, water quality is a critical factor for fish movement and in-transit feeding.	The area has good connections to all major regional transportation systems; although somewhat limited, back-up land for industrial and commercial development is available in portions of the planning area, particularly in the Junction City area and along portions of the south shore; good currents keep the need for channel maintenance at a minimum; some relatively productive feeding and rearing areas do exist for crab and fish, particularly in the western portion of the planning area.
III	Planning Area III is a mixture of urban-industrial development and natural resource areas. The predominant developments are its heavy industrial uses and port facilities. Within the natural resource areas, the main resource types are tide flats and salt marsh.	Committed developed uses include: major industrial and port development, regional air and rail transportation, upland log storage, and dredged material disposal. Committed resource uses include: water fowl and shore bird resting, feeding and rearing areas, fish rearing and passage, crab rearing and commercial fishing.	The primary conflicts exist between the demands for the development of new industrial areas and the loss of fish and wildlife habitat that would result from the required filling. Specific conflicts result from potential dredge material disposal from channel deepening and maintenance, filling of tide flat areas north and west of Bowerman Field and use of filled lands and shorelines for non-water dependent uses.	The planning area represents the prime area remaining for large industrial expansion in immediate proximity to the navigation channel, land-based transportation facilities, other urban facilities and a local labor force. At the same time, it represents an area of high food production for water fowl, shore birds, crab and fish.
IV	The predominant character of Planning Area IV is aquatic, with heavy tidal influence and low intensity development.	The use of the area is mixed, with substantial committments to commercial fishing, oyster production and crab and fish rearing. Additional important uses include hunting and recreational fishing, wildlife observation and sparse upland development, including some agricultural products processing.	The planning area is relatively free of conflict except for the potential effects of navigation channel dredging and disposal on adjacent oyster rearing areas, particularly in the Whitcomb Flats area of the realigned channel. The ability of the area to maintain its natural productivity and continue to assimilate up-river waste discharge could be a long-term conflict.	The planning area contributes substantially to commercial and sport fishing and to shellfish productivity. Its large water area allows it to play an important role in waste assimilation. Finally, the area is without substantial development pressures.
V	The predominant character of the planning area in natural, aquatic with heavy tidal influence. Along with Planning Area VII, this is the least disturbed planning area in the estuary.	Primary uses within the planning area include resource production and harvesting. Specific uses include: oyster and fish rearing, water fowl and shore bird resting, feeding and rearing, recreation and commercial harvesting of fish, shellfish, wildlife, and uplands agriculture.	The only foreseeable conflict is with upland residential development pressures in the north and eastern portions of the planning area.	The planning area contains the largest water surface area within the estuary. Additionally, it contains the largest population of water fowl and shore birds, one of the estuary's largest fisheries and a substantial amount of the oyster rearing and harvesting in the estuary.
VI	The character of the planning area is a mixture of urban, residential/recreational and estuarine. While there is substantial urban development with homes, home sites, a marina and other businesses, the area also contains areas of natural, estuarine influence.	Primary committed uses within the planning area include the Oyhut Wildlife Recreation area, the Ocean Shores marina, developed homes and homesites, recreational hunting and fishing, passive recreational/water use on large areas of publically owned waterfront lands, the north jetty and oyster rearing and harvesting.	Most conflicts relate to the continued development of the residential/recreational uses in the City of Ocean Shores and the preservation of unique or important natural areas along the shoreline. The major specific conflicts are with the proposed relocation of the Ocean Shores airport to a site along the shoreline and with the marina entrance channel maintenance dredging and spoiling.	A principal asset of this planning area is its ability to absorb a large amount of the long-term demand for recreational/residential development and destination tourism. It also contains areas that contribute to the total productivity of the estuary and unique areas (such as the Oyhut Refuge) that have permanently preserved natural assets. Its proximity to the ocean is also considered an asset.
VII	The predominant character of the planning area is natural.	In addition to a substantial fish and shell fish resource and wildlife habitat, the area is committed, through private clubs, as a major private recreational area for hunting and wildlife observation. The small residential area of Bay City is also a part of this planning area.	The planning area is relatively free of conflicts although maintenance of the authorized channel could create pressures for uses that would be inconsistent with the predominant character of the area.	The principal asset of the planning area is that it is a relatively undisturbed natural area with no conflicts or pressures.
VIII	The predominant character of the planning area is urban fishing. The substantial commercial and sport fishing facilities and supporting activities dominate the physical, social and economic character of the developed portion of the planning area.	Committed uses are those that directly relate to the commercial and sport fishing industries. Those facilities include a marina, airport, state park, fish processing industries, supporting commercial and tourist facilities and the south jetty revetment and groin system. Productive salt marsh areas exist in the southern part of the planning area.	The principal conflicts occur with proposals to continue to develop fishing and tourism facilities and the adjacent estuarine resources. Specific conflicts include expansion of the marina and airport site, continuing increases in the overall intensity of use of the shoreline and adjacent water areas, in-water dredged material disposal and general shoreline property development.	The primary assets of the planning area are its proximity to the ocean and its substantial committment to support the commercial and sport fishing industry. Additionally, the planning area marina facilities serve as a port of refuge for a substantial area of the Washington Coast.

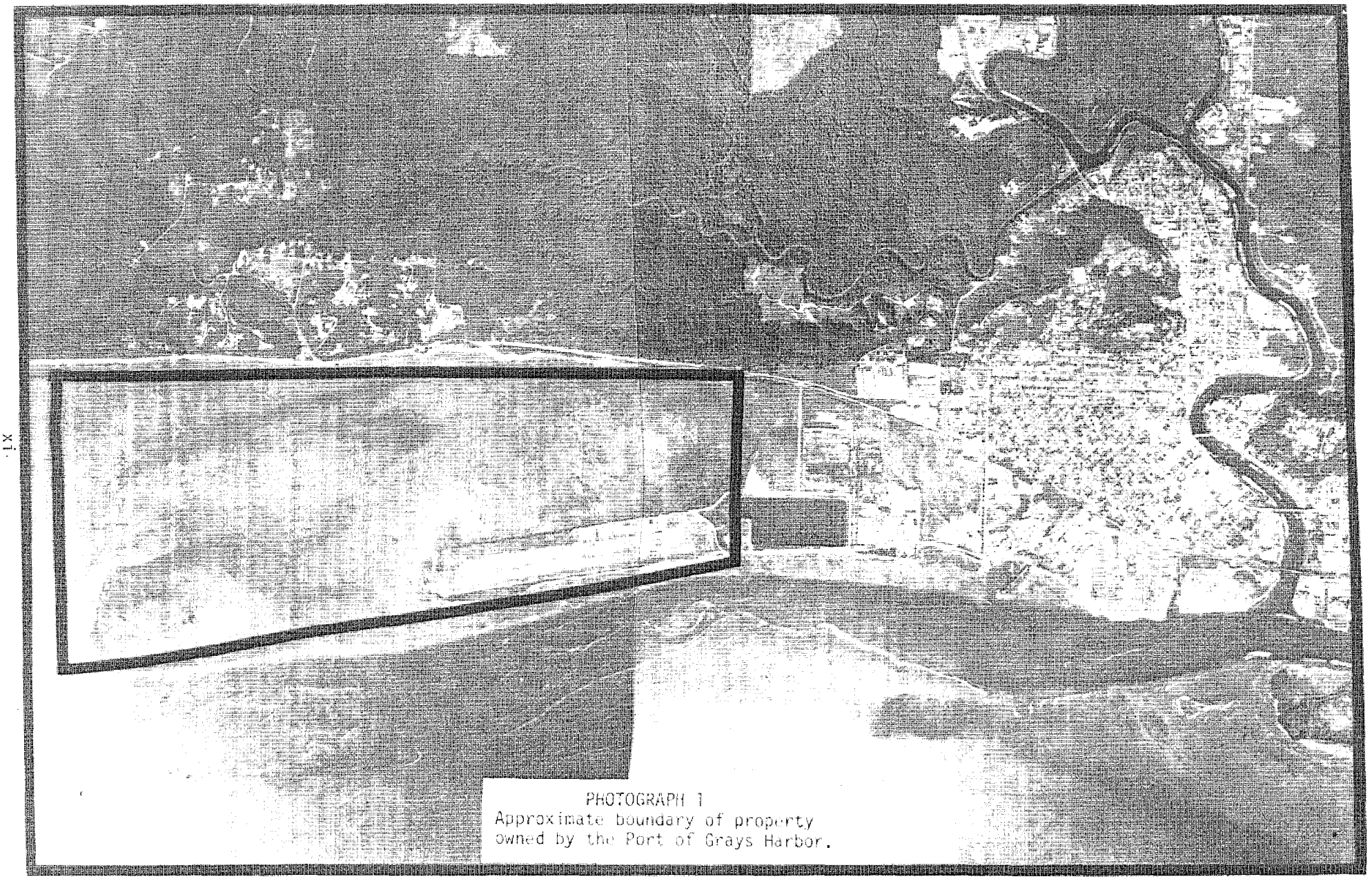
viable estuarine system. Given the topography of the area surrounding the estuary, any growth of large-scale activities tends to encroach from the shoreline into the water since flat, developable upland is limited. Therefore, almost all proposals for new activities tend to be controversial.

1. Management Unit 12 - Bowerman Basin

a. The major controversy identified by the Task Force and the scoping process focuses on the 2200 acres of intertidal and submerged lands owned by the Port of Grays Harbor (see photo 1). The area is well suited for future large-scale port expansion given its location next to the navigation channel and supporting infrastructure and is considered to be the major site for future industrial development. The area has also been identified as a significant habitat for wintering and migratory shorebirds and the peregrine falcons which prey upon the shorebirds. The area is significant because it provides the birds a certain amount of shelter from approaching storms and is a prodigious feeding area (during seasonal migration in particular). While much of the environment has been modified by previous fills and dredged material disposal, the majority of the environment remains highly productive. The intertidal areas and fringing marshes are important for benthic invertebrates, some fish species and other wildlife as well.

b. In initial Task Force discussions, the Port of Grays Harbor proposed that all 2200 acres owned by the Port be designated as an Urban environment and be available for fill and development. Based on an early appraisal of the impact of that proposal, such designation was found unacceptable within the context of long-term protection of the estuary. A subsequent proposal would have divided the 2200-acre area into two different environments: a 500-acre Urban Development Special environment (MU 13) and a 1700-acre Conservancy Managed Special environment (MU 12). The 500 acres were located north of the airfield and would be available for fill and development under certain conditions regarding future uses. The 1700 acres were located to the west of the airfield and were to be turned over for co-management by a State/Federal or a private conservation organization for a period of 50 years. Further controversy ensued over whether the uses which were allowed by the plan in MU 13 were consistent with the 404(b)(1) Guidelines (September 5, 1975 version) and over new discoveries concerning the importance of the Bowerman Basin to migratory shorebirds and peregrine falcons.

c. Because the 404(b)(1) Guidelines were in the process of being revised during the 1978-79 period, further changes to the plan were not made until everyone knew what the standards of the Guidelines would be. Shortly thereafter, Section 7 consultation under the Endangered Species Act was initiated by the OCRM with the U.S. Fish and Wildlife Service concerning the impact of the fill in the Bowerman Basin as proposed in 1978. The F&WS made a determination that the configuration of the 500 acre fill may jeopardize the continued existence of the American peregrine falcon (spp. anatum) with the potential of a non-jeopardy opinion if protective measures would be implemented. With the suggestions of nonmember conservation groups, the Task Force developed a substitute proposal with conditions and configurations for development and preservation which are included in the April 1982 draft of the plan. Those conditions include permanent transfer of submerged and submersible lands owned by the Port of Grays Harbor to the Washington State Department of Game, reestablishment of vegetated salt marshes and woody vegetation, reestablishment of



PHOTOGRAPH 1
Approximate boundary of property owned by the Port of Grays Harbor.

perching sites for birds, containment structures and others (see GHEMP, MU 12, pp 60-67 for further details). It should be pointed out that the commitment for fill and the evaluations extend only to Areas 2 and 3 in MU 12 and that Area 4 (243 acres) fill will be assessed independently at the time of a fill proposal; however, filling of an additional 243 acres is considered to be within the original balance of the plan.

d. It is believed that MU 12 can now comply with the 404(b)(1) Guidelines at a planning level (full evaluation can not be completed until the time a specific permit application is received), and that further controversy between representatives of the Task Force has been minimized. MU 12 (MU 13 was deleted and combined with MU 12) clearly represents compromises between preservation and development and attempts to achieve a balance between the two. The compromises, however, will not satisfy certain groups which believe the area is extremely critical to the bird population and that no further fill should be permitted in the area.

2. Estuary Protection

a. Several groups have commented that while future port expansion may take place, protection for the natural estuarine resources is not commensurate. Although permanent protection is afforded the 1700 acres in MU 12 (if the 500 acres are filled), these groups observe that the amendment process could allow changes to be made to the estuary's other Natural and Conservancy environments. Some more permanent form of protection of the estuary is the preferred goal of these groups to limit any further expansion into North and South Bays.

b. Other resource protection conflicts which have arisen during the course of the planning process include:

(1). Bankline straightening - proposed mainly for urban development areas, some see it as a positive, strategic move to be more efficient with development in the urban areas whereas others see it as a source for more aquatic habitat losses.

(2). Chehalis River - problems associated with aggregate resources extraction during the salmon runs.

(3). Chehalis Floodplain (MU's 18-25) - a transition area between estuary and upstream area which stores a great deal of water and is ecologically significant. MU's 18, 19, 24 and 25 have special conditions placed on future uses to protect the important resource areas.

(4). Westport Marina and Airport expansion into adjacent wetlands.

(5). Ocean Shores Airport and the issue of water dependency and adequate mitigation.

(6). MU 26 - Freshwater wetlands owned by the Port of Grays Harbor on the south side have been designated as an appropriate site for future industrial development, and so anticipates filling of the wetlands at some future date. The Port has applied for a Section 404 permit from the Corps and an analysis of impacts and an EIS are being prepared for the specific action.

During the planning process, controversy had arisen over the marsh adjacent to the shoreline, buffer zones needed to protect two creeks which flow through the property, and the interim use of this area for dredged material disposal.

(7). Protection of the "fish base" and the "fish passage" in a complex urban boundary setting.

(8). Log rafting and avoidance of log grounding.

(9). Wood waste and other solid waste disposal in the estuarine environment.

(10). Bowerman Airport relocation - upland vs. estuarine site.

3. Adequacy of the Planning Process

Several individuals have criticized the planning process as inhibiting citizen input at the early stages of the process and suggested that a DEIS should have been prepared at a much earlier time. It is their feeling that the Task Force should have contained members from the non-governmental environmental community, and that their comments throughout the process have not been adequately taken into consideration.

D. ISSUES TO BE RESOLVED

1. Throughout the development of the draft GHEMP, numerous issues were brought up and resolved through the consensus and mediation process, particularly issues dealing with individual projects and activities such as airport and marina locations, the protection of the "fish base," bird habitat, etc. The mediation process was necessary at times to help settle the disputes between development and preservation interests through compromise. While basic differences in goals are not necessarily resolved, they have been accommodated in the overall goal of balanced estuary-wide management. Consequently, the objectives of preservation vs. development have been reconciled in a multiple-use plan which specifies uses on a MU by MU basis and places special conditions on future actions to protect the significant natural resource values. No major, outstanding issues to be resolved by the Task Force members are identified at this time.

2. However, a coalition of public interest groups has submitted an alternative which is called the Citizen's Grays Harbor Estuary Management Plan as a distinct alternative to some of the provisions of GHEMP which they would like to have evaluated and adopted by the Task Force. This proposal is discussed under the "Lesser Development-Greater Protection" alternative (p. II-21). The Citizen's Estuary Plan rejects any fill in MU 12 and the 20 acre site in MU 14, requires the relocation of the three airports (Bowerman, Westport and Ocean Shores), and rejects the expansion of the Westport Marina and filling of the 95-acre site in the South Industrial area (MU 26). Further, this plan would recommend using Section 404 (c) authority under the Clean Water Act to prohibit the discharge of dredged or fill materials in 25 of the 43 MU's in an effort to provide more permanent protection. It would allow water dependent development in areas currently deemed unutilized (293 acres), the Bowerman Peninsula (approx. 200 acres) and 250 acres of fill elsewhere in the estuary. It calls for the establishment of a Citizen's Advisory Committee which would have oversight responsibilities to ensure that available areas were developed to their satisfaction prior to allowing any further fill.

3. While many of these issues have been discussed during Task Force deliberations, they should now be formally accepted or rejected (in whole or in part) by the Task Force as a viable alternative since this is part of the official review process.

E. MAJOR CONCLUSIONS

1. Need for the GHEMP

There is a distinct need to update and revise the current local Shoreline Master Programs in order to assure areas for critical development and preserve habitat from long-term cumulative degradation by small projects. Likewise, for the sake of those proposing to use the estuary, the intergovernmental decisionmaking process must be improved to provide predictable reactions by all regulating and commenting agencies. Future project consistency with the GHEMP will provide greater assurance of conforming with applicable State and Federal management requirements and expeditious action on proposals.

2. Benefits

a. Adoption of the GHEMP will provide both short and long-term social, economic and environmental benefits. The plan allows for the following: future large-scale port and industrial development next to the navigation channel which will provide greater regional economic benefits; expansion of the Westport Marina; expansion and improvement of the Westport Airport; construction of an airport at Ocean Shores; the modification of port slips; and improvements made to portions of the older urban waterfronts. The plan calls for providing greater recreation opportunities in certain areas around and within the estuary. It provides better protection for the Hoquiam-Aberdeen Fish Passage, most of the saltwater marshes and eelgrass beds, and it will provide permanent protection to a minimum of 1700 acres of important intertidal wetlands currently owned by the Port of Grays Harbor. In addition, the plan includes mitigation requirements and will provide further codification of the local SMP's.

b. Administratively, the plan if adopted should make permit processing considerably easier and with fewer incidents requiring conflict resolution. Some of this may be due to the relationships established by the Task Force members as they cooperatively worked to understand the complex issues of development vs. preservation and work out their differences. However, the plan is not designed to solve all future problems since there are many issues which surround the siting of facilities besides wetlands fill; thus the reason for the necessary case-by-case review of any particular project. The Task Force has nevertheless taken many other factors into account prior to considering the amount of fill which might be required in the future, including available energy and water supply, wastewater treatment capability, commitment to maintaining and possibly widening and deepening the navigation channel to accommodate large deep-draft vessels, space requirements, etc.

c. From a planning and management perspective, the GHEMP would effectively place limits on future growth in the estuary requiring further fill. The plan would accommodate future projected demand and expectations for several generations to come, but once the area west of the Bowerman Peninsula is utilized and the 1700 acres in MU 12, Area 1, have been turned over to the Washington Department of Game, no further expansion along the navigation channel will be

feasible. This therefore provides an end point to westward industrial expansion along the navigation channel and a framework upon which future decisions can be made. This is a significant concession from the Port of Grays Harbor. While the Port gains a (planning) commitment to utilize certain wetlands for future port/ industrial expansion (which they might or might not achieve in the absence of the GHEMP), the Port also gives up a potential future development option of considerable significance.

d. Additional benefits of the planning process and plan include the resolution of many planning decisions on potential development proposals which occurred during the planning period prior to the receipt of an actual permit application. The Task Force, along with the considerable assistance of the public and noted experts in the field of ornithology, were able to identify the importance and significance of the Bowerman Basin as (particularly) shorebird and raptorial habitat. This may be one of the first instances where consultation under the Endangered Species Act has provided a plan which would give permanent protection to a majority of a particular habitat utilized by the American peregrine falcon and its prey species of dunlin, sandpipers, and other shorebirds; require monitoring of impacts during phased filling and enhancement of habitat; and allow future development in a portion of the habitat. All this was done years prior to the request or issuance of a permit. Special area management planning has in this case provided increased attention to habitat preservation for an endangered species in a manner which to date has not delayed individual permit projects or development plans.

3. Impacts

a. When and if development occurs in the MU's which allow or may allow development (through conditional use or special conditions), a number of shoreline and estuarine alterations will take place having both short- and long-term impacts. Depending on the type of development, those impacts would include effects associated with the filling of aquatic areas, including the loss of primary productivity, invertebrate production, and fish and wildlife habitat; reduction of the water surface; and other effects associated with physical, chemical and biological changes to the environment.

b. MU 12.

(1). The most significant adverse impacts would occur in MU 12, which allows for the phased development of 164 acres of intertidal mudflats and wetlands; 73 acres of mudflats and marshes; and under a more long-term scenario, the addition of 243 acres of submerged and intertidal areas. These intertidal mudflats and marshes contain significant habitat for wintering populations of shorebirds and for the spring and fall migration populations which use the habitat for short but intensive periods of time. This area also produces invertebrates which are food for anadroumous fish and shellfish.

(2). During filling operations the bird populations that frequent the off-shore and near-shore areas around the Bowerman Peninsula will be displaced or confined more closely to the adjacent habitat, with the potential for some mortality of birds because of the reduction of habitat (especially during long winter storms or migration flights). Monitoring, mitigation and enhancement projects could help minimize the probability of bird mortality. While total bird mortality cannot be predicted with any degree of accuracy, it can be

presumed to occur because of the loss of feeding habitat in particular, and roosting habitat to a lesser degree.

(3). The plan gives clear recognition of the importance of the habitat to shorebirds and peregrines, but allows some development with mitigation in this area. However, some bird experts who have studied the area feel that any filling done in the area of the Bowerman Basin (and even industrial development on the Bowerman Airfield) will produce unacceptable levels of impact on the shorebird population, that the area has international significance and should be designated as a bird sanctuary. For more on this discussion, see appendix 3.

(4). It is the conclusion of this PDEIS, based on the findings and conclusions of the U.S. Fish and Wildlife Service which were rendered during Section 7 consultation, that the impacts associated with MU 12 implementation would not have an unacceptable adverse impact on either the shorebird (prey) species or the endangered American peregrine falcon (predator). This assessment holds only if the current provisions of the plan are implemented and the conditions issued by the F&WS are implemented in the future.

(5). This is not to minimize the importance of the shorebird habitat (particularly Areas 2 and 3) which would be altered by development. As stated in the plan and consistent with existing regulatory practices, any new information which may be advanced either prior to or during the permit process stage or during development will be taken into consideration at that time. The purpose of the plan is to provide guidance based upon the best available information while balancing the factors of economic development and environmental protection. It is not an actual permit request. All interested and concerned parties who now know that the identified areas may be developed in the future should continue to work jointly in further defining and evaluating the consequences of the action, and in conducting monitoring, mitigation and enhancement to the extent feasible before and after any filling operations. To the extent that OCRM has financial resources available in the future, we will encourage and assist these efforts through the WDOE. It is also the conclusion of this environmental analysis that any remaining reasonable and prudent alternatives and conservation measures which have been identified by the U.S. F&WS during Section 7 consultation be incorporated into the plan if appropriate or in any future permit requests to modify MU 12. This can best be accomplished by the Port of Grays Harbor, the U.S. F&WS, the U.S. Army Corps of Engineers and the Washington State Department of Game.

c. GHEMP's multiple use goal and the associated designated uses will perpetuate the use of the estuary as a major port and industrial area which will require continuous maintenance dredging, potential channel realignments, widening and deepening, etc. The impacts associated with these activities have been extensively researched and addressed by the Army Corps of Engineers.[1] Long-term implications are that the estuary will continue to be subject to modifications for navigation purposes (i.e., as opposed to the decision not to maintain the Willapa Bay Navigation Channel).

1. U.S. Army Corps of Engineers, Maintenance Dredging and the Environment of Grays Harbor, Washington, Seattle, 1977 (15 Volumes).
   U.S. Army Corps of Engineers, Grays Harbor, Chehalis and Hoquiam Rivers, Washington Channel Improvements for Navigation, Interim Feasibility Report and FEIS, Seattle, 1982.

4. NEPA Requirements

The OCRM, as well as the cooperating agencies, is well aware of both the desirability and requirement of distributing a DEIS as early in the decision-making process as practicable - when sufficient information is available to analyze the options and when the decision to act is yet to be made. This PDEIS satisfies those conditions. The April 1982 draft version of the GHEMP is the first draft to which the Task Force has given conceptual but not full approval. The document remains subject to modification based upon further public review as clearly identified in the planning process. No action has been taken to approve the plan officially by either the Task Force members or in this case the actual decisionmakers (i.e., local governments, the WDOE or any Federal agency representatives). While the Task Force had to make decisions and come to consensus on other controversial management issues, it should be remembered that these decisions were not made in a void. The Task Force had considerable resource data available while deliberating on the policies and management issues, and any permits which were issued during 1977 to the present time have been done in accordance with regular procedures for permit processing. OCRM believes that strategically, this is the best time to issue the EIS, as it will serve well the goal of being a full-disclosure document in which the public and the decisionmakers can understand the impacts associated with plan implementation and the options which are available.

5. Citizen Participation

a. OCRM has studied the complaint that there has been insufficient citizen participation in the development of the GHEMP and that the provisions of the CZMA and the WSMA have not been met. OCRM concludes that the actions taken by the Task Force in developing the GHEMP have included adequate public participation efforts and that the public interest has both been substantially expressed and served as summarized below.

(1). The Task Force consists of fourteen individuals representing affected local governments, the Port of Grays Harbor which is a special purpose unit of local government, and State and Federal agencies. The local government officials represent the public in development and environmental matters. The State and Federal agency officials represent the public interest in environmental matters including resource management and protection. While specific industry and environmental interest groups did not hold voting memebership on the Task Force, public input from such interests was substantial. The consultants to the Task Force held meetings with a number of environmental interest groups as did various individual members of the Task Force.

(2). Sixty-eight extensive interviews were conducted with a diverse group of individuals representing all facets of interests in the estuary during the data collection phase. Various media were used to describe the GHEMP and solicit input. A public hearing as well as public meetings were held and numerous modifications to the various versions of the GHEMP have been made in response to that input. The Task Force clearly intended that at least two drafts of the plan be subjected to full-scale public review prior to agency adoption.

b. There are many different methods which can satisfy the requirement to include meaningful participation. Some of these are being used in other parts of the country in developing special area management plans and other forms of comprehensive coastal management plans. Any one form designed to allow full participation may be subject to criticism from an individual(s) or organization(s). While no one form of public participation is dictated by law, the minimum requirements under the CZMA include the following: making general information available regarding the program's design, its content and its status throughout program development; providing a list of affected individuals or organizations and indicating the nature of major comments received and the nature of response to the comments; holding public meetings, etc., at accessible locations with reasonable notice and availability of materials; and holding public hearings with 30 days notice (15 CFR Part 923.55-58, FEDERAL REGISTER, Vol. 44, No. 61, Wednesday, March 28, 1979, pp. 18610-18612).

c. Neither OCRM nor the WDOE are in a position of endorsing one form of citizen participation over another when it is the option of local governments or State agencies and as long as minimum requirements outlined in regulations are met. While the citizens' participation process designed and utilized in the GHEMP has legitimacy, that is not to say that it could not have been done in a different way. Perhaps most importantly, if citizens and interest groups are not satisfied with the outcome of a collaborative planning process, opposition to permit applications or proposed projects in the planning area is likely to impair the usefulness of the plan.

F. FUTURE ACTIONS

1. A public hearing will be held on this PDEIS in Grays Harbor County to solicit public comments on the draft plan and impact statement. The Task Force will review and consider these comments prior to adopting a final plan for submission to the local governments and Federal agency officials. The PFEIS will be based on this final version of the GHEMP.

2. Once this PFEIS has been distributed, local governments will hold additional hearings on the plan in accordance with local regulations. Based upon the results of the hearings, local governments may or may not adopt the provisions of the plan or make revisions to the plan accordingly.

3. If adopted, local governments will in turn submit their SMP's to the WDOE for State adoption. The WDOE will also hold a formal hearing on the adoption of the GHEMP as State regulations and as an amendment to the approved WCZMP. If significant substantive changes are made to the GHEMP by the local governments, OCRM would issue a supplemental EIS prior to making final "Findings of Approvability" and will publish notice in the FEDERAL REGISTER that the provisions of the GHEMP have been amended into the WCZMP. Following such notice, any specific provisions identified in the Federal agency LOI will become effective as do the Federal consistency provisions of the CZMA.

COASTAL ZONE
INFORMATION CENTER

PART I: PURPOSE AND NEED

PART I: PURPOSE AND NEED

A. GENERAL

1. The GHEMP is designed as a tool to assist Federal, State and local government management agencies to guide the future development and conservation of the Grays Harbor Estuary, including specific project regulatory decisions that are made on a case-by-case basis. The full realization and use of this management tool will require normal regulatory and management decisions of Federal, State and local agencies and elected officials to be consistent with the plan. Not only will Federal and State agencies and local governments be expected to deny project proposals inconsistent with the approved GHEMP, as required by Section 307 of the Coastal Zone Management Act and by the Shoreline Management Act, but they will be expected to approve expeditiously those project proposals that are consistent with the approved plan, so long as Federal and State regulatory criteria not addressed fully by the plan are met. GHEMP, pp. 4-6, explains more fully how the plan relates to the regulatory processes.

2. GHEMP is a form of special area management planning which is becoming more and more popular in coastal states as a mechanism to harmonize economic development with crucial environmental regulations. The majority of these conflicts are taking place along the shorelines where encroachment into the aquatic environment is the major issue of concern. Most of the newer environmental laws and regulations encourage or require Federal agencies to coordinate and cooperate with other entities including State and local governments to plan comprehensively for the resources of given areas in order to minimize or avoid these conflicts over resource use and protection. GHEMP does satisfy these existing statutes to coordinate and consistency with these laws and regulations is discussed in Part V of this environmental impact statement (EIS).

B. PROGRAM EIS

1. The proposed action described in this environmental document is the incorporation of a final plan as an amendment to the WCZMP and approval of the GHEMP by a variety of Federal, State and local government agencies. This EIS is also intended to satisfy the requirements of the Washington State Environmental Policy Act of 1971 (SEPA) for local government and State agency adoption of the GHEMP, in accordance with SEPA Guidelines (WAC 197-10-650) which allow for an adequate Federal EIS prepared pursuant to NEPA to be utilized in lieu of a State EIS prepared under SEPA. This jointly prepared EIS is also consistent with the Council on Environmental Quality regulations (§1506.2, 40 CFR Parts 1500-1508) encouraging cooperation between Federal, State and local agencies in planning and environmental assessments to avoid duplication between NEPA and comparable State and local authorities.

2. Since GHEMP is a comprehensive land and water use plan intended to guide future actions in the estuary and adjacent shorelines, this EIS will serve as a program EIS (PEIS) because of the broad actions which it envisions for a specific geographic area. Federal and State agencies (and local governments under SEPA) are encouraged to tier future EIS's and environmental assessments (EA's) to this PEIS for future actions which are consistent with the plan in order to eliminate repetitive discussions. This is consistent with

the NEPA Guidelines (§1502.4, 1502.20) and SEPA Guidelines (WAC 197-10-660(1)(a) and (3)). Information on proposed actions, alternatives and impacts that are discussed adequately in the PEIS and the GHEMP will, in some cases, satisfy the NEPA and SEPA requirements for future project proposals, and, in other cases, those proposals will need to be supplemented in GHEMP and the PEIS with more detailed information and analyses. However, where the information on specific proposals is considered to be adequate by the permitting agencies and where information and conditions have not substantially changed, the policies and decisions of agencies are expected to be consistent with the GHEMP.

C. NATURE OF THE ACTION

1. This PEIS serves to describe and evaluate several proposed actions, including:

a. Substantial changes to approved local Shoreline Master Programs (SMP's),

b. Substantial change to the Washington Coastal Zone Management Program (WCZMP) resulting from the local SMP changes, and State agency commitments to the GHEMP,

c. Federal approval of these changes as an amendment to the WCZMP, by the Assistant Administrator for Ocean Services and Coastal Zone Management, NOAA,

d. Federal commitments to the provisions of the GHEMP and local SMP changes, through the following actions:

(1). Letters of Intent signed by regional representatives of the Corps of Engineers, Environmental Protection Agency, Fish & Wildlife Service and National Marine Fisheries Service.

(2). Advanced identification of areas suitable and unsuitable for dredge spoil disposal pursuant to Part 230.80 of the 404(b)(1) Guidelines (see alternatives discussion), and

(3). Use of the PEIS as a guide to or part of subsequent project specific environmental analysis for significant Federal, State or local actions under NEPA and SEPA.

2. The following text discusses each of these proposed actions in more detail:

a. Changes to approved local SMP's for Hoquiam, Aberdeen, Westport, Ocean Shores, Cosmopolis and Grays Harbor County

(1). The GHEMP represents in some instances a substantial change in the local SMP's previously approved by the Washington DOE, and incorporated as a part of the WCZMP prior to its approval in June 1976.

(2). Under normal circumstances, modifications to local SMP's under the SMA would not be considered as amendments to the WCZMP and require an EIS. However, because there are some substantial changes to the SMP's and the GHEMP has been the subject of nationwide interest as an example of special area management planning for an area of particular concern involving active participation and commitment of numerous Federal, State and local agencies and the public, the plan is being reviewed as an amendment and an EIS is being prepared. The DOE has asked OCRM to prepare an EIS on the amendment to the WCZMP in anticipation of future approval and because this advance action would allow the combination of NEPA and SEPA documents. An official State request to approve the amendment will be presented to OCZM after the adoption of the plan by local governments but prior to or concurrent with approval by DOE of the revised local SMP's.

(3). This PDEIS, therefore, prepares the groundwork for future decisions regarding approval of the State amendment by the Assistant Administrator and appropriate officals of the cooperating agencies. The review of the submitted amendment will include a final review of any changes which may be made by local governments during their review and approval process, and any changes the State may make.

b. Amendment to the Washington Coastal Zone Management Program

(1). This action is related to the previous one. The WCZMP identifies Grays Harbor as an "area of particular concern." In addition, the area is also identified as a "shoreline of statewide significance" under the SMA. The WCZMP states: "To assure continued productivity, a balance between filling of intertidal areas and the preservation of wetlands must be maintained. Since the filling of lowlands has provided the only flatland available for industry and commerce in the area, pressures to fill are not uncommon." (WCZMP, June 1979, p. 19). GHEMP represents what the Task Force considers that balance to be. Four State agencies participated in the planning process and provided their expertise to the land and water use designations which were made. GHEMP will guide State agency actions and decisions in the future so a commitment to the plan and its implementation represents a substantial change to the WCZMP. The plan itself will be amended into the program as a policy and management program for an area of particular concern which will be implemented through the changes made to local SMP's.

c. Approval by the Assistant Administrator as an amendment to the WCZMP

(1). The OCRM has funded major portions of the development of the GHEMP through Section 306 funds of the CZMA which were provided to the Washington DOE, which in turn funded the GHRPC to assist the local governments

in revising their local SMP's. The purpose was to address the problems associated with an identified "area of particular concern."

(2). It is proposed that the Assistant Administrator approve GHEMP as an amendment to the WCZMP under § 306(g) of the CZMA. § 923.80(c) of OCRM regulations states in part:

> amendments are defined as substantial changes to enforceable policies or authorities related to...(2) uses subject to the management program; and (3) criteria or procedures for designating or managing areas of particular concern or areas for preservation or restoration. (Part 923 - Coastal Zone Management Program Development and Approval Regulations, FED. REG., Vol. 44, No. 61, Wed., March 28, 1979).

(3). The GHEMP is a unique management tool (See Part III: Proposed Action) which requires not only actions to be taken by the State and local governments pursuant to the SMA, but also Federal agency commitments to the plan. One action without the other would not make GHEMP the useful tool envisioned. Because the proposed action will both amend the WCZMP and be used by Federal agencies to review permits, OCRM is serving as the lead agency in the preparation of the PEIS and other Federal agencies are serving as cooperating agencies. All decisions will therefore be made from a common assessment of the proposed action.

d. Federal Agency Commitments

(1). The action taken by the Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (Corps), the U.S. Fish and Wildlife Service (F&WS) and the National Marine Fisheries Service (NMFS) has consisted of providing substantive technical assistance in the development of the plan. Recognition of this assistance is expressed through Letters of Intent (LOI - see appendix B). Representatives from these agencies have been involved in the planning process for more than seven years. They have participated in data collection and review, development of proposals for various MU's, and provided comments on their agency guidelines or standards. In some cases, representatives from both the regional and headquarters offices have been involved in preliminary plan negotiations. (The Corps was not involved in plan negotiations and provided technical assistance only). Because of the positive effort made by the agencies in the planning process which involved consensus decisionmaking, the plan will be legitimately entitled to a substantial measure of favorable recognition during plan implementation. This is provided for in EPA's 404(b)(1) Guidelines (§230.10(a)(5)) and by the Fish and Wildlife Coordination Act.

(2). The LOI, expresses each agency's recognition of the plan, its participation in the planning process, and its commitment to utilize the plan in future permit decisionmaking when appropriate. Some LOI are more detailed than others at this stage.

(3). Federal agency involvement in the planning process, whether it is through Task Force membership or serving solely in a technical assistance capacity (Corps), is expected to bring benefits to all parties concerned. The

agencies are in a position to use the plan in their decisionmaking process on the resources and permits which they regulate or comment on. Because of direct participation in the development of the plan, the agencies are generally confident that it meets the standards and criteria which they are obligated to enforce. Adoption of the plan will therefore expedite permit reviews and approval, especially for some of the larger and more controversial proposals. However, as stated in the plan (GHEMP, p. 5), the plan does not bypass the Corps permitting process, nor any of the §404(b)(1) criteria used in considering a permit. The plan has advanced consideration of these issues and has reviewed some in great detail in the plan itself.

(4). The most common form of a Federal agency response to the plan will take place when applicants request a permit under Section 404 of the Clean Water Act (which is often combined with a Section 10 permit request under the 1899 Rivers and Harbors Act). The final plan along with the FPEIS on the plan are intended to respond to some of the more general requirements of the Section 404 permit. The extent to which the plan addresses these requirements varies. These requirements include:

- need - which relates to water dependency and need for a project,
- alternative site availability in non-wetland areas, and
- the acceptability of impacts on the aquatic ecosystem.

(5). The plan and the data supporting it will provide an estuary-wide look at these issues. In the case of certain management units, detailed data and analysis have occurred on one or more of the issues which the 404 Guidelines address such as the Ocean Shores Airport, Westport Airport and Marina, and MU's 12, 18, and 26. For those units, the plan will provide essential information for agency review. Unless new and significant data are available, the plan's conclusions on the issues of need, alternatives and impacts will be presumed correct. The strength of the presumption will vary depending on the degree of analysis which has been completed for a given MU. All §10/404 permit applications must provide the project-specific and site-specific details for a final decision regarding these tests.

(6). Generally, "permitted" activities and uses authorized under the plan are those which are most likely to meet Federal permit criteria. "Conditional" permitted activities are those which will likely meet Federal permit criteria only if special care is taken to avoid negative environmental impacts through specific project/site conditions. "Special condition" activities are allowed by the plan only if they incorporate the special conditions listed in the plan which were designed to reflect the unique characteristics and needs of each MU. The special conditions were developed with reference to Federal permit criteria whenever practicable and reflect an evaluation of acceptable (or unacceptable) impact on the aquatic ecosystem. Those activities which are not authorized by the plan and are depicted by blanks, will generally result in a negative recommendation (see appendix B, NMFS LOI).

(7). Finally, and in general, the plan will be considered by the Corps in the public interest review it undertakes for each Section 10 and 404 permit as well as other permits. The plan's concepts, policies, and procedures can form a primary basis for the Corps review of such issues as conservation, economics, wetlands, navigation, fish and wildlife values, etc. (33 CFR 325.3 (b)), which are evaluated in the public interest review. In the absence of substantial new and countervailing evidence, permits will conform with the plan.

(8). There are two additional (potential) ways an agency may respond in addition to issuing or commenting on individual permit requests.

(a). The first method, which is identified in the plan, is for the advanced identification of areas for disposal or non-disposal of dredge or fill material under 40 CFR, Part 230.80, Guidelines for Specification of Disposal Sites for Dredged or Fill Material. While advanced identification has never been implemented by the EPA and the Corps, the plan envisions the permanent protection of Area 1 in MU 12 (1700 acres) through transfer of fee title of Port of Grays Harbor lands to the Washington State Department of Game and by requesting predesignation of this area as one where disposal of dredged or fill material is prohibited with the possible exception of small habitat enhancement projects. Likewise, the plan calls for the advanced identification of Area 2 in MU 12 (164 acres) as an area for the discharge of dredged or fill material for water-dependent industrial development subject to permit approval.

(b). The second method which may simplify permit processing by utilizing the plan, is for the Corps of Engineers to issue a §10/404 General Permit (aka Regional Permit) under 40 CFR, Part 230.7 for certain activities which are identified in the plan and meet the criteria for General Permits. A General Permit is not an essential element to implement the GHEMP but could help achieve the objectives of simplifying the permit process. The criteria for General Permits require that they be activities which are substantially similar in nature, cause only minimal adverse environmental impact when performed separately, and will have only a minor adverse cumulative effect on the quality of the human environment.

D. NEED FOR THE GRAYS HARBOR ESTUARY MANAGEMENT PLAN

1. General. As we have increased the protection of valuable coastal resources during the past two decades, our regulatory system has become more complex. Although most coastal development proposals are approved without undue problems, in coastal areas where complex natural resource and economic development issues must be balanced within limited geographic boundaries, the system of case-by-case review by multiple agencies at times leads to delays, protracted disputes, loss of valuable habitats and considerable uncertainty for applicants, agencies, and interested citizens. Problems arise as a result of applying inconsistent or single-purpose, competing policies among government agencies, lack of guidance to applicants and others about agency policies that will be applicable to specific permitting decisions, inability to address issues of cumulative impact, excessive costs to applicants and the public, and real and perceived misuses of case-by-case permit review procedures. Problems also arise when development interests fail to consider natural values early in project planning, especially in areas where local plans and zoning ordinances do not require such consideration.[1]

1. NOAA, The Federal Coastal Programs Review - A Report to the President, January 1981, p. 238.

2. Grays Harbor Estuary

a. The Grays Harbor Estuary includes 62,000 acres of water, tidal marsh and partially developed shoreline, and is Washington State's largest port outside of Puget Sound. It is one of the few large coastal bays and estuaries on the west coast; it supports more than 50 species of fish, large populations of clams, oysters and crabs, and 325 species of birds. The economies of six cities and towns depend upon shorefront industries such as ports, timber processing, fishing and recreational boating. A 23-mile navigation channel requires periodic maintenance dredging by the Corps which historically has supplied much of the shoreline fill upon which large parts of the communities and industries have been built.

b. Since the beginning of the century, the towns of Aberdeen, Hoquiam, Cosmopolis, and Montesano have been exporting wood products from facilities located on land created by dredged material deposited in marshes and intertidal mudflats. Between 1940 and 1976, maintenance dredging disposal involved alteration of about 3,850 acres of aquatic habitat or an average of more than 100 acres per year. This represents 11.5 percent of the total intertidal lands in the estuary and the loss of an estimated 1,540 acres of vegetated wetlands. Since 1975, an additional 69 acres of wetlands have been converted to uplands.[1]

c. The 1970's have thus been a transition period in which the rate of altering wetlands has decreased by an order of magnitude from approximately 100 acres per year to 10 acres per year due mainly to the new environmental and institutional constraints placed on development during the last 15 years and the Corps shifting of maintenance dredge disposal from shorelines to open water sites. The other major factor in the decrease is the depressed market economy since the 1973-74 OPEC oil embargo which has affected the demand for additional port/industrial space. From an environmental protection point of view, the substantial decrease in altered wetlands may be considered a success story, but the transition period has not been without cost in other areas.

3. History of Conflicts. Several articles have been written describing the events which led up to the need to develop the GHEMP. Some of the articles are included in appendix D for the benefit of those who are interested in its history. The following section will only briefly outline the events which showed the necessity for the various agencies and organizations involved to sit down together and attempt to resolve the conflicts which were or would be generated between the requests to fill wetlands and the various constraints which are placed on such fills.

a. In 1974, the GHRPC, together with the local communities around the estuary, prepared local SMP's that were adopted by the WDOE in 1975 under the SMA. However, even though the local programs involved broad citizen and agency participation, they were unable to resolve major interagency conflicts. Federal resource agencies claimed that the SMP's were prepared without adequate resource information, provided inadequate guidance for aquatic activities, and was too general. The Port of Grays Harbor and some local units of government felt that the SMP's unduly restricted development because among other things, it designated 2,100 acres of Port-owned tidelands and wetlands as conservancy

1. Corps of Engineers, Long-Range Maintenance Dredging Program - Grays Harbor Chehalis River Navigation Project, O&M FEISS No. 2, Oct. 80, Seattle. and personal communication.

areas.[1] In addition, the local SMP's were not consistent with approved Economic Development Plans and local zoning ordinances and regulations. For example, certain wetlands are zoned for heavy industry, while in the SMP's they may be included in a Conservancy environment designation.

b. Conflicts over development proposals by the Port to fill 39 acres of wetlands (of a 45 acre site) at the mouth of the Hoquiam River for first the construction of a lumber mill site and later for the Kaiser Steel Company to assemble offshore drilling platforms; a proposed waterfront motel and restaurant in the City of Aberdeen; and a proposed Boise-Cascade Corporation sawmill requiring fill, involved local, State and Federal agencies in controversies and permit delays lasting up to two years. The permits were nevertheless issued and the wetlands filled. The Kaiser and Thunderbird Motel sites have not yet been developed (see appendix D, pp. D-17 thru D-22 for further details).

c. The confrontation over these projects frustrated the interests of all parties in the decision process. The Port's development plans were stymied by State and Federal agency opposition to the Corps permits. Local government decisions were overturned by State agencies, blocking development plans in areas designated "Urban" in the State-approved local SMP's. State and Federal resource agencies were subject to intense political pressures from elected officials at all levels over specific permits and from environmental interest groups trying to stop further filling of the estuary. Congressional office support was taxed by repeated pleas from constituents on each project. In general, the local and private interests were frustrated by their inability to predict the outcome of public decisions, or understand the criteria or standards by which these decisions were being made.

d. With the encouragement of Senator Henry Jackson, the F&WS and the NMFS urged that a more specific plan be prepared that could address the cumulative effects of future development proposals. The agencies indicated that they would recommend rejection of all subsequent development proposals in the estuary until all parties had developed an overall plan for the estuary. The Port of Grays Harbor also urged the development of such a plan, because 2,200 acres of port-owned tidal lands were directly affected. The situation was ripe for more effective collaborative planning involving all parties to these disputes. GHEMP was a concept advanced to provide a consistent bridge between economic development and environmental concerns.

e. As part of its Coastal Zone Managment Program approved in 1976, the WDOE designated the estuary as an area of particular concern and funded the GHRPC to establish a collaborative intergovernmental planning process. Each unit of local government, State agency and Federal agency with legal jurisdiction over the use of the estuary was brought together to form the Estuary Planning Task Force in the Fall of 1976. The purpose of the Task Force is to serve as an advisory body to the local governments. Even though 7 1/2 years have passed, many of the members serving on the Task Force today are original members.

1. NOAA, Federal Coastal Programs Review, p. 270.

4. <u>The Grays Harbor Estuary Management Plan</u>

a. What is it?

- o A comprehensive land and water use management plan for the estuary and surrounding shoreline.
- o A revision of the Grays Harbor County Local Master Program and individual local SMP's.
- o Its planning period is long-term (indefinite) and gives official recognition that there are limits to the amount of fill which the estuary can sustain without unacceptable adverse impacts to the estuary as a whole.

b. What are the desired and potential benefits?

- o Develop a coherent and consistent set of planning goals and objectives relating to the use, protection, enhancement and development of a particlar coastal resource - the estuary.
- o Reduce interagency conflicts over permit decisions by developing consensus among all public agencies with legal jurisdiction over the estuary's use and encouraging collaborative planning and continuous dialogue through the recommended amendment process.
- o Provide greater predictability to permit decisionmaking and expedite the review of permit applications based on prior agency participation in developing the plan.
- o Provide a balance between competing needs for economic development and protection of the natural functions of the estuary.
- o Provide long-term protection for valuable coastal resources and minimize adverse impacts.
- o Manage a system which spans local jurisdictions.
- o Provide a management tool to determine the cumulative impacts from incremental dredge and fill decisions.
- o Avoid duplicative or identical determinations at the planning and permit levels of review.

c. What doesn't it do?

- o Take away agency responsibilities or authorities.
- o Take away the public's right to comment on individual proposals.
- o Resolve all conflicts.
- o Answer all the questions or information required for individual permits.

5. Successful implementation of the plan will depend upon the extent to which local, State, and Federal agencies will use it as a guide for permit and project review decisions, and the extent to which the general public accepts the results of the planning process.

COASTAL ZONE
INFORMATION CENTER

PART II: ALTERNATIVES

PART II: ALTERNATIVES

A. GENERAL

1. This part describes the proposed action and a number of alternative actions, including both procedural and substantive alternatives, which are divided into five separate categories. The first alternative to be considered is the action which is proposed (i.e., approval and adoption of the GHEMP). The second alternative includes no action (i.e., rejection of the plan) by one or a number of participants. The third alternative includes different policy approaches which were considered by the Task Force plus a Citizen's Management Plan alternative which has not yet received full consideration. The fourth alternative includes a set of alternatives considered in the designation of urban areas and cites specific conditions with respect to future development activities. The discussion of alternatives in the third and fourth categories considers both estuary-wide and regional issues. The fifth category of alternatives includes different methods of implementing the plan.

2. This part is also intended to serve as partial fulfillment of the Sec. 404(b)(1) Guidelines (40 CFR Part 230) which have been issued pursuant to the Clean Water Act (33 U.S.C. 1344). Part 230.10(a)(5) states that:

> To the extent that practical alternatives have been identified and evaluated under a Coastal Zone Management program,... such evaluation shall be considered by the permitting authority as part of the consideration of alternatives under the Guidelines. Where such evaluation is less complete than that contemplated under this subsection, it must be supplemented accordingly.

In an effort to avoid management conflicts, the Task Force has attempted to integrate as many of each agency's requirements into the planning process as possible, including an evaluation of alternatives to the actions contemplated in the plan. In addition there is a requirement under §307(f) of the Coastal Zone Management Act which requires that the Federal Water Pollution Control Act, as amended, and the Clean Air Act, as amended, shall be incorporated into any coastal management program. Therefore, any action which allows or recommends the destruction of wetland habitat through dredge disposal or fill must review the practicable alternatives to that action.

3. While the GHEMP is not a permit application, its purpose is to satisfy many of the broader alternative requirements of the §404(b)(1) Guidelines in advance of specific permit applications by identifying the most appropriate sites for development and those areas which require protection. As individual permits consistent with the plan are applied for, various permitting agencies (Corps of Engineers, local government agencies and State agencies) may find it appropriate to refer to this PEIS under the concept of tiering as fully or partially satisfying requirements for analyzing alternatives. Naturally, final analyses of §404 criteria will be based upon project specifics.

B. PROPOSED ACTION - A GRAYS HARBOR ESTUARY MANAGEMENT PLAN

1. The proposed action is the approval and adoption of the GHEMP (after any modifications made as a result of this public review) as described in Part I of this document. A copy of the draft plan is included as Appendix 1 and a summary of the plan is described starting on page ii. Reviewers are urged to take the time to read the plan and study its various provisions in order to gain a complete understanding of the proposed action. The procedure used to structure the plan is both geographically and biologically based and summarized below.

2. Goals and Guidelines

a. The overall goal of the GHEMP is a broad goal which embodies the concept of balance in the development and preservation of the estuary as a whole: "The Grays Harbor estuary will be managed for multiple uses." This goal is consistent with the use of most major estuaries in the United States and sets the stage for the continued use of the estuary as a deep draft navigable harbor to be used for port related uses. The other types of multiple uses allowed are identified in the Standard Use Matrix (GHEMP, p. 109). These uses are generally the same as those presently allowed in and around the estuary and therefore do not represent significant changes. Therefore, while the impacts associated with the multiple use goal may be significant, they are not considered as being unreasonable since it is the clear intent of the plan's goal to provide a balance between the various human uses of the estuary while protecting the overall integrity of the estuary's natural systems.

b. Given a specific set of criteria, the estuary was divided into eight Planning Areas (I-VIII), each having a set of Planning Guidelines for the management of that Area's natural resources and development (GHEMP, pp. 29-47). As an example, Planning Area VII (pp. 43-44) states that the South Bay area is predominantly natural and relatively undisturbed. The bankline will be maintained in its present natural configuration except for those areas needed to maintain the existing highway, bridge, control features and tidegates. Recreational hunting and fishing and the commercial fisheries industry (fish and oyster rearing) are encouraged to continue to use the area. The guidelines state that dredging to maintain the navigation channel from Point Chehalis to the Elk River Bridge to its authorized depth is not compatible with the area. If implemented, the Guidelines will encourage or constrain future proposed activities within the Planning Areas.

3. Management Units (MU's)

a. The Grays Harbor estuary and surrounding shoreline are further subdivided into forty-three different MU's within the Planning Areas. The boundaries of the MU's and the designation given each MU are a further refinement of the existing "environment types" used by the local governments in developing their local SMP's. This approach provides management recommendations specific to and consistent with the characteristics of the various environments in and around the estuary. These MU designations (illustrated in GHEMP p. 111) are shown in table 1.

TABLE 1
Breakdown of Management Unit Designations

		Single Unit	Split Unit	Total
Natural	-	2	5	7
Conservancy Natural	-	1	2	3
Conservancy Managed	-	8	8	16
Rural Agricultural	-	3	0	3
Rural Low Intensity	-	4	3	7
Urban Residential	-	2	0	2
Urban Mixed	-	4	5	9
Urban Development	-	4	3	7
Special (Unit 12)	-	1	1	2

b. A summary is set out below of the location of the various categories of MU's.

Natural (N)

Natural categories are concentrated in the North and South Bays (MU's 2, 6, 9, 18, 29, 34, and 41). Most of them are identified as split units (e.g., Natural below the line of aquatic vegetation, and a Conservancy or Rural designation on the upland side).

Conservancy Natural (CN)

CN categories are located in the Westport-Whitcomb flats (MU's 30, 38, and 42).

Conservancy Managed (CM)

There are seventeen CM areas distributed throughout the estuary in addition to the major water and intertidal areas of the harbor (MU's 1, 3, 7, 19, 20, 24, 26, 28, 29, 33, 34, 35, 36, 37, 40, 43, and 44).

Rural Agricultural (RA)

There are three areas containing RA classifications in North Bay (MU 8), near Montesano (MU 22), and in South Bay (MU 31).

Rural Low Intensity (RL)

The areas containing RL classifications can be found along the east side of North Bay (MU's 9 and 10), along the South Channel across from the Hoquiam-Aberdeen area (MU's 27, 30, 32, and 36), and near Melbourne (MU 23).

Urban Residential (UR)

There are two areas designated in the estuary as UR, the Ocean Shores area (MU 5) and the Central Park Area (MU 21).

Urban Mixed (UM)

UM designations are predominantly applied in the Westport area (MU's 33, 35, 37, 38, and 39), in Ocean Shores (MU's 4 and 6) and in Aberdeen (MU's 16 and 17).

Urban Development (UD)

UD designations are located in or adjacent to present industrial/commercial centers. The most extensive area so designated is the Hoquiam-Aberdeen waterfront (MU's 11, 14, 15, 18, 26 and upstream to Cosmopolis MU 25); MU 28 is located near Markham.

Special (SP)

MU 12 (MU's 12 and 13 in earlier drafts) has received a Special MU designation because it is a unique area combining both valuable habitat to be protected and future sites for the principal industrial expansion in the harbor. MU 19 is designated Special Conservancy Managed because the long-term use of the area has not been established.

c. Approximately sixty-eight percent of the estuary waterfront will be designated within MU's designed to conserve Grays Harbor's natural resources. Table 2 compares the estimated water frontage in conservation and development categories.

TABLE 2
Estimated Waterfront in Generalized Conservation and Development Categories

Grays Harbor Estuary Management Plan

Conservation Management Units		Development Management Units	
Est. Waterfront	Est. Percent	Est. Waterfront	Est. Percent
82.5 miles	67.5	39.8 miles	32.5

Notes: Because of split MU's, the estimated miles of waterfront above exceeds the Estuary's approximately 96 miles of waterfront. An estimated 24 miles of waterfront is in split conservation and development management units.
Source: Grays Harbor Regional Planning Commission staff analysis, 1983.

(1). Figure 4 displays the Grays Harbor Estuary waterfront classified into generalized development and conservation categories based on the MU in which the area is designated.

(2). The estimates in table 2 and the classification in figure 4 are based on the same methodology. The MU's were classified into the conservation and development category based on the level of natural resource protection afforded by the unit and the MU's permitted uses. The following MU's or portions of split MU's were classified as conservation: Natural, Conservancy Natural, Conservancy Managed, Rural Agricultural, Rural Low Intensity, and the Natural portion of MU 12 (Special). These units are characterized by a high

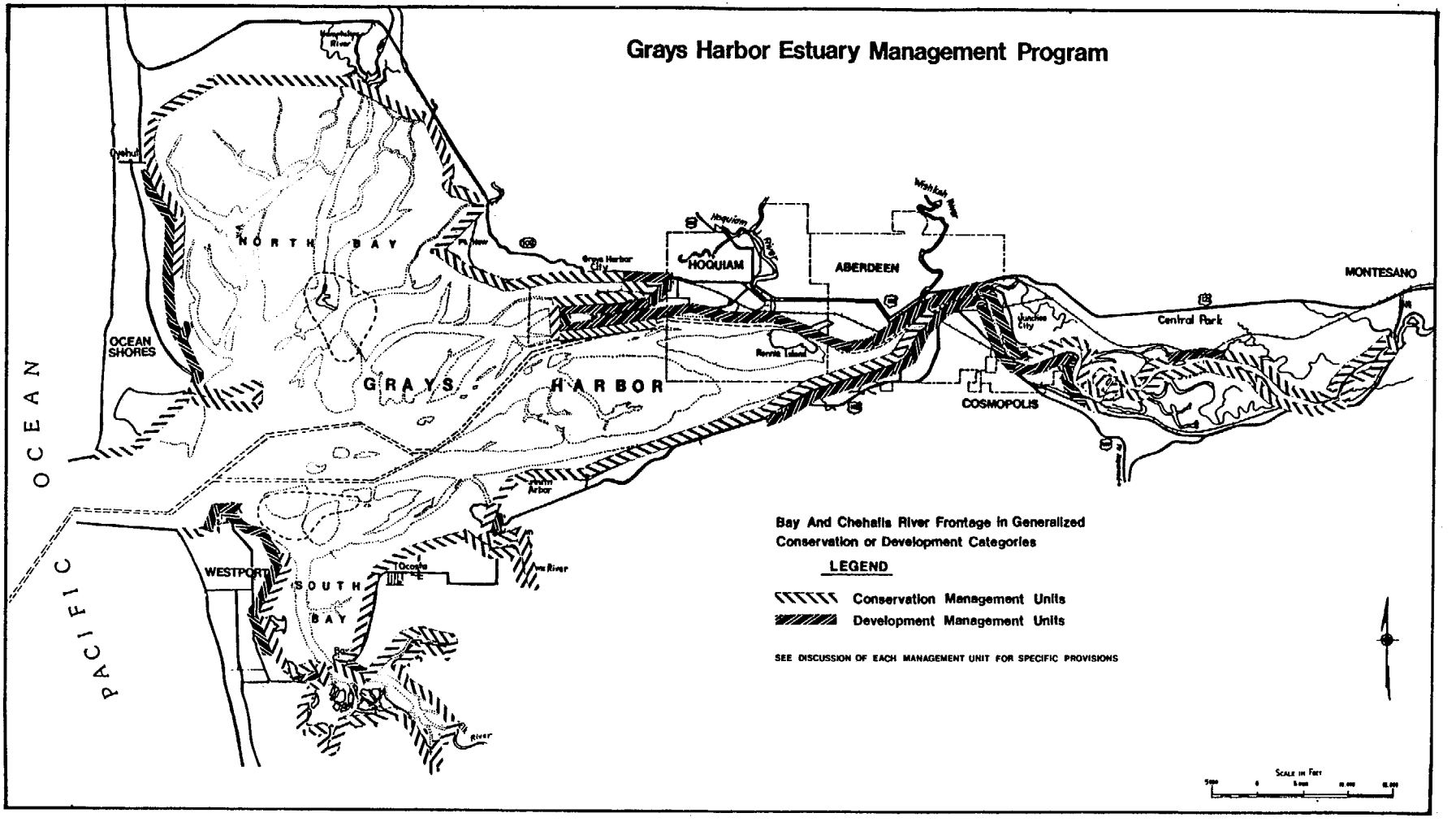

Grays Harbor Estuary Management Program
OCEAN
PACIFIC
OCEAN SHORES
NORTH BAY
GRAYS HARBOR
HOQUIAM
ABERDEEN
MONTESANO
Central Park
COSMOPOLIS
WESTPORT
SOUTH BAY
Bay And Chehalis River Frontage In Generalized Conservation or Development Categories
LEGEND
Conservation Management Units
Development Management Units
SEE DISCUSSION OF EACH MANAGEMENT UNIT FOR SPECIFIC PROVISIONS

FIGURE 4

Do Not Scan

Reprep-Insert Do Not Scan Document Here

Document ID: Grays Harbor Estuary Management Plan

Page #: II-7 Figure 5

4. Policies

a. The plan provides general policies under which future modifications of the estuary will be managed, regulated or permitted and was designed to provide more specific guidance to the land and water users of Grays Harbor.

b. Definitions and Terms. The plan has many definitions but perhaps the two most important are terms associated with what is a "permitted use" and a "conditional use."

(1). Permitted uses conform with the plan but are not permitted outright since they must meet certain requirements and conditions (GHEMP, p. 19). Nevertheless, it is presumed that they will be able to meet those requirements and conditions within the specific MU's in which they are permitted.

(2). Conditional uses generally conform with the objectives of particular Management Categories or MU's, but because they have potential problems inherent with a specific use or activity, special care must be taken to avoid negative impacts through the application of project/site specific conditions. Five specific criteria must be satisfied before a conditional use becomes an allowable use (GHEMP, p. 17). Despite general consistency with the plan, a conditional use or activity may be inappropriate because of specific circumstances surrounding a proposal or because of unique characteristics of the proposal, and may not be found permissible after case-by-case review.

c. Structures. The plan regulates and designates areas where various types of structures may be placed in the water or wetlands of the estuary. There are eight classes of stuctures (piers, docks, wharves; piling & mooring dolphins; bridges; causeways; outfalls; cable/pipeline crossings; boathouses; and breakwater) identified in the plan. The Task Force members believe they have given careful consideration to ensure that essential environmental qualities are conserved in each MU where the structures are permitted, conditional or require special conditions. Generally along municipal urban areas, a larger number of structures are permitted. In less intensely developed areas, structures are more often designated as conditional uses and are generally intended to support private, recreational and other forms of limited development.

d. Banklines. The plan identifies where and occasionally under what conditions modifications may be made to the bankline. The policy is designed to protect both natural conditions as well as urban needs. There are seven types of aids (diking, bulkheading, groins, jetty, special project fills, bankline straightening, and bankline erosion control) with only a few of them considered as permitted activities. They are generally located at the mouth of the estuary and are needed to protect existing or planned uses and activites.

(1). The purpose of bankline erosion control is to protect property along banklines from erosion. Activities permitted include riprapping and minor straightening and sloping of the bankline to stabilize uplands and prevent accelerated erosion. The policy contains ten stipulations or conditions which must be applied and does not allow bankline erosion control for the purpose of gaining developable uplands from existing water areas. Erosion control is generally allowed in more urban and intensely used areas or where potential erosion of the shoreline may affect adjacent uses such as industrial and commercial waterfront activities and transportation facilities. Where the

policy is allowed as a conditional use or under special conditions, the areas are generally more environmentally sensitive and a more critical review is required prior to allowing any modification. Under the existing local SMP's shoreline protection measures are allowed in all but the Natural environment and are a permitted/conditional use in the Conservancy environments. The proposed policy is more stringent and constraining than the existing provisions of law under the Washington SMA (WAC 173-16-060(17)-Shoreline Protection); it is not unilaterally permitted in all Urban and Rural MU's, nor is it a permitted/conditional use in all Conservancy MU's. Bankline erosion control measures are not permitted in the Natural MU designations. The Task Force has taken measures during the planning process to carefully delineate where bankline erosion control activities may be appropriate and require greater environmental safeguards which are clearly spelled out in the policy (GHEMP, p. 24). Overall, this policy is more beneficial to the Grays Harbor environment than the existing policy and provides greater predictability for those who would choose to carry on such an activity.

(2). In specific MU's, small fills may be permitted for the purpose of straightening the bankline to consolidate uplands into usable parcels. The policy (GHEMP, p. 25) contains eleven criteria which will apply to activites involving bankline straightening (in addition to the normal Federal Section 404 permit requirements). The policy limits any single fill to two acres or less measured from the Line of Non-Aquatic Vegetation to the toe of the fill. Bankline straightening is permitted only in three MU's in the Hoquiam/Aberdeen waterfront (MU's 15, 16 and 17) and under special conditions in MU's 12, 18 (UD), and 25. Once again, the policy and its application in specific MU's are more restrictive to users than that which currently exists under existing local SMP's under which landfills are permitted in the Urban environments and permitted/conditional in all Rural and Conservancy environments.

e. Channels. The primary function of channel policies is to ensure safe passage of ships, allow channel maintenance, and shorten the total channel length. There are three designations of activities (new access channel channel berth maintenance, and channel realignment) to include the creation and maintenance of a side channel connnecting the main navigation channel, dredging of shoal materials from an existing channel and dredging to relocate an existing channel. Due to the environmental impact of dredging and other channel policy activities, care has been taken to permit such activities only where necessary, particularly the Westport and Ocean Shore Marinas. Channel/berth maintenance is the only activity which is permitted in MU 44 as it is essential to the economic stability and vitality of the region.

f. Log Rafting. The policy allows log rafting to continue under specific conditions and in specific areas. The policy is designed primarily to avoid the adverse impacts associated with log grounding and any adverse environmental impacts associated with expansion into new areas. Log rafting areas are shown on the map in the plan (GHEMP, p. 110).

g. Mitigation. The Mitigation Policy is discussed in Part II, Section G.

5. Plan Concepts

a. The overall impetus to develop a comprehensive land and water use plan was the need to minimize recurring conflicts over the location and cumulative impacts associated with development. These conflicts centered on the permit applications for development projects in the aquatic environment. Therefore, the plans boundary or jurisdiction was limited to the aquatic and adjacent shoreline area where local, State and Federal agencies all have jurisdiction. Specifically omitted were the rest of the watershed (2,550 sq. mi.) of the estuary or the "total ecosystem," the ocean and beach waterfront, and the fastlands of Ocean Shores and Westport whose management are the responsibility of the local governments. Modifying the local SMP's was determined to be the best management tool which would help resolve the development/preservation conflicts.

b. The Urban Waterfront and the Fish Passage

(1). The GHEMP has attempted to focus development away from the "fish passage" or the shallow intertidal and subtidal areas which are found in the mixing zone between fresh and salt water. During periods of out-migration of juvenile salmonids (specifically chum and chinook), this area is located in the urban areas of Aberdeen and Hoquiam, the areas most likely to be developed in the future under the existing SMP's. It is here where major transportation routes come together, where the most infrastructure is located, and where zoning and water dependency would allow further encroachment into the wetlands and shallow areas to reach the navigation channel. Specific resources particularly in danger were a few shallow areas for downstream migrating fish adjacent to the shore which were considered by some resource managers to be vital resting and feeding areas and provide safety from predation while they adjust to the greater concentrations of salt water and gain in size. Also key to the passage's ability to support anadromous fish runs during smoltification are several large remaining marsh areas on the south shore needed for their nutrient supply. The importance of these areas has more recently been confirmed by Simenstad and Eggers in studies conducted for the Corps.[1]

(2). As vital as this area is, there is nonetheless some opportunity for new development if particularly important aspects of the aquatic habitat are protected and if incremental effects could be limited in a predictable way. Such development opportunity was especially important to the Task Force in order to allow for the badly deteriorated urban waterfront to be rehabilitated. For such rehabilitation some flexibility was needed so that new development could be encouraged in an appropriate manner. To implement these objectives, the plan uses the following techniques:

(a). The ultimate extent of development's encroachment into the passage would be limited to protect the passage. Changing environment designations from Urban to Conservancy Managed waterward of the line of ordinary high water and placing limits on "bankline straightening" would be used to implement this limit.

1. Simenstad, C.A. and D.M. Eggers, 1981. Juvenile Salmonid and Baitfish Distribution, Abundance and Prey Resources in Selected Areas of Grays Harbor, Washington, U. of Washington Fisheries Research Institute, prepared for Seattle District, Corps of Engineers.

(b). Within the ultimate limits, greater flexibility would be allowed the cities with dilapidated waterfronts to encourage redevelopment. In particularly key areas, it was agreed to allow water-oriented commercial uses in the Urban Mixed MU's.

(c). Especially important areas, known as the fish base and the South Aberdeen marshes, would be specifically protected in specified ways.

(3). While these compromises answer some of the needs in the urban area, they do leave one very important need unanswered: where should new heavy industrial uses be sited? As long as this need was not met within the plan, the fish passage could be jeopardized by such developments in the future. The plan is not acceptable to the local area unless it addresses the area's need for such space. While some areas are considered within existing developed areas, none adequately meet modern industrial siting needs. For example, the south shore industrial disposal area was examined at length but its lack of direct economical water access (and the threat that poses to the South Aberdeen marshes) make this a less than effective answer since the types of industry most need by the region are linked to the navigation channel.

c. The Bowerman Industrial Area

(1). MU 12 is designated in the plan as the solution to the need (addressed in (3) above) to provide adequate area for new water-dependent industrial uses while protecting the fish passage upon receipt of appropriate permits. A total of 500 acres of new industrial land which may be developed in this area plus the additional use of the Bowerman Peninsula is considered enough area to meet the water-dependent industrial needs of the region indefinitely if used wisely. It has always been the intent of the Port of Grays Harbor to eventually develop the entire 2200 acre area for industrial expansion. The major reasons the area was selected include:

- location adjacent to the navigation channel and downstream from Cow Point which will reduce required dredging,
- previous impact on the area by long-term dredged material disposal,
- ability of the existing infrastructure, including transportation, to serve the area readily, and
- ownership of property by the Port of Grays Harbor.

(2). The major drawbacks to this use are the presence of the airport and the importance to avian fauna.

(a). The planning process considered relocating the airfield away from the estuary, but study proved this not to be feasible.[1]

(b). In the earlier stages of planning, the area committed to development was that part most affected by dredged material disposal (i.e., the 500 acres north of the airfield and west of the Hoquiam city limits. While this was less desirable from an economic point of view (since it was away from the navigation channel), the environmental impact was at the time condsidered to be less significant.

1. CH_2M Hill, Bowerman Field Relocation Planning Study, GHRPC, 1979.

(c). Subsequent to this decision in 1978 it was noted that this area was an exceptional environment for shorebirds which included shelter from storms, raised elevation to permit a longer feeding period, and an abundant food source. The shorebirds are in turn a favorite source of prey for some of the predators including merlins and peregrine falcons. While it was known at the time of the original decision that the area was extensively used by shorebirds, public participation in the planning process coupled with a concern regarding how the modification of this area might affect the endangered peregrine falcon (the first confirmed sighting of the endangered species variety of the peregrine falcon - Falco peregrinus anatum was made by Dr. Steve Herman on October 31, 1979) which feeds on the shorebirds, led to a reformulation of this aspect of the plan.

(i). Future development in the area is now designated to the west of the airport (Area 2), thereby lengthening the peninsula. While the plan contains a preliminary planning commitment to allow even further fill (Area 4) in a westerly direction, there are a number of conditions which may direct expansion beyond (Area 2), elsewhere.

(ii). The airport is conditionally allowed to move the runway north (Area 3). Its relocation would be dependent on the impacts associated with the filling of Area 2 and a commitment to use the airfield for water-dependent industry. The airport is generally a low-intensity use and may serve as a buffer from industry. The airport fields are sometimes used by the shorebirds as roosting sites.

(iii). Most of the prime shorebird habitat will be permanently preserved (the easterly portion of Area 1), with the potential for future enhancement projects in the westerly portion of Area 1 providing additional improved shorebird habitat.

(d). MU 12 represents a most difficult tradeoff which mediates the needs of economic development, fisheries, and birds. As currently designed, it attempts to take all three into consideration in the decisionmaking process.

d. Airports

(1). One of the most troublesome policy concerns in the planning process was the conflict between aeronautical needs and resource agencies concern for wetlands protection. Since airports consume large areas and are not water dependent uses, resource agencies resist their siting and development in estuarine areas. The agencies feel that such areas can be better used in resource protection or in absorbing development pressure. However, since estuarine land is relatively inexpensive, relatively easy to buffer from development (residential encroachment, etc.), and relatively easy to develop for runways, it is often desired for airports sites. Three estuarine sites for airports in Grays Harbor (at Bowerman, Ocean Shores and Westport) compounded this policy dispute. The airports in the plan were each considered with respect to costs to the natural resources, ability to meet aeronautic and community needs, and whether there were viable alternatives. It was determined that there was a lack of viable alternatives. This led to extensive negotiations between the resource agencies and the local communities in order to reach some accommodation regarding each of the airports.

(2). Ocean Shores. At Ocean Shores, before the initiation of the GHEMP planning process, plans were well in progress to relocate an airport from a hazardous and constrained site in the middle of a commercial/residential area of the city to a wetlands area just east of the peninsula. These plans were already controversial and were therefore deliberately added to the Task Force deliberations for resolution in comprehensive context. The Task Force determined that the proposed site was the best alternative but that the extent of development would be severely limited to the minimum amount needed (as defined by FAA standards). Ownership of the remainder of the marsh area would be transferred to a resource agency or an independent nature conservancy organization. The compromise not only meets the needs for an airport but also establishes a limit for the extent of development into the estuary.

(3). Westport. The airport at Westport is currently located on drained marshlands. The area is often too wet to permit safe landings. The plan allows some realignment and improvements to be made in exchange for the city's commitment to conserve large areas of marsh land, once again establishing a limit for development in the marshes.

(4). Bowerman Airfield. Addressed above.

e. Public Access and Waterfront Rehabilitation

(1). Some of the plan's most significant policy implications are not clearly specified in the text of the plan itself. Two such concerns are public access and waterfront rehabilitiation. These concerns were a priority for the affected cities. Similar to other development activities, the plan sets down limits within which these activities may occur; allowing the agencies and parties responsible for implementing such activities some freedom to develop within those limits.

(2). In the case of urban waterfront rehabilitation, the policy clarifies what types of development could be permitted. The plan provides more flexibility, because of the safegards developed in the plan for the fish passage area to permit the affected cities more options to pursue in their efforts to redevelop the waterfront. This is especially true for the waterfront near the confluence of the Wishkah and Chehalis Rivers. Prior to the plan, resource agency policy generally sought to limit development to strictly water-dependent uses and not water-related commercial activities. The plan now clearly allows such commercial development and is consistent with attempts to revitalize urban waterfronts throughout the country.

(3). Public access opportunity in the plan ranges from highly developed facilities such as a waterfront park in Aberdeen, marinas, boat ramps, etc., to very low intensity areas where such access is provided by the absence of development. Generally, water access is provided in a manner consistent with the intensity of existing development, developed facilities in urban environments (marinas, water-related commercial development, waterfront parks) and undeveloped opportunity in undeveloped areas. This pattern tends to be consistent with the need to avoid intense access in areas with fragile biological resources.

C. NO ACTION

1. A no action alternative essentially maintains the status quo within Grays Harbor and could be achieved through the following means: first, local governments, individually or collectively, could decide not to amend their local SMP's and comprehensive plans to conform to the applicable provisions of the plan; second, the DOE could deny local SMP amendment requests. While not negating local government adoption, plan implementation would be weakened if Federal regulatory agencies decided not to utilize the plan. Finally, NOAA could disapprove the amendment request if it decided the plan does not meet Federal requirements or that it would have an unacceptable adverse environmental impact.

2. This alternative course of action would continue the current situation of divergent actions of the various agencies which exercise regulatory or management authority in the estuary without the benefit of a comprehensive framework on which to base decisions. This alternative leaves open the current situation for public agencies (including local governments) to pursue single issue goals and objectives which may or may not be related to one another and which may have a high potential for conflict between them. This course of action also continues both the uncertainty regarding the outcome of any project proposal in the estuary area and the sometimes lengthy permit processes, adding to the cost of development as well as government administration. A lack of coordinated public policy among the Federal, State and local agencies creates confusion and frustrates individuals seeking permission for various actions as well as agencies attempting to manage the bay's resources and regulate such requests for the public good. Such confusion and conflict will lead to continued political intervention, a situation the Task Force sought to avoid in future decisionmaking.

3. Whether this alternative would in actuality produce greater or lesser impacts on the environmental quality of the estuary is difficult to assess since such impacts would depend upon future actions under the existing system. Generally, it can be expected that the adverse environmental impacts would most likely be greater for the following reasons.

a. The current system is oriented toward a case-by-case review of individual projects as they occur without the benefit of a comprehensive land and water use management plan which enjoys any degree of confidence from State or Federal agency representatives in which an attempt has been made to integrate their agency standards and concerns into what is normally a local land use planning process. The exisiting local SMP's are more permissive than the GHEMP (as discussed under item 5 below) and would therefore theoretically allow more development if proposed. While substantial development permits may be more difficult to obtain, few have actually been denied. In such situations, the ultimate impact will depend on which projects are proposed and how effectively each is advanced through the regulatory review process. Laws and regulations are almost constantly being amended so there is no real long term stability or permanent criteria on which to judge actions; ergo, there are no guarantees that what may be allowed or prohibited one day will be allowed or prohibited the next. This uncertainty generally tends to favor development.

b. The difficulty of predicting the ultimate effect of individual permit decisions under current regulatory systems poses a potential longrange adverse environmental problem. The estuary is a complex, fragile ecosystem. Any one project by itself, if carefully designed and sited, may be acceptable, but the cumulative effects of such projects may pose a serious threat to the overall ecosystem. Also, a presently acceptable project may not be acceptable in the future due to its combination with other projects. Because the case-by-case approach cannot anticipate these future problems or conditions, it more difficult to evaluate cumulative effects of incremental permit decisions as required by NEPA and the 404(b)(1) Guidelines.

c. The existing system also poses an additional potential environmental problem in being unable adequately to balance competing concerns for the use of the estuary. The present permit system cannot address concerns regarding the "best" or most suitable alternative for a particular use or activity. The current system responds to specific proposals, it cannot direct development. It enters the picture only after a proposal is developed, a site selected, ownership questions resolved, and some investments made. This limits the ability for meaningful alternatives analysis. Furthermore, due to the conflicts in the existing agency programs (because of imperfect intergovernmental coordination) a prospective developer has no guidance in how best to direct preparations. Since this ability to evaluate and influence alternatives is limited, greater environmental damage might occur due to the "best or least damaging" site for a particular project not being selected while an "acceptable" but less appropriate site is approved. This problem can become very serious when it is combined with the cumulative effects of many projects.

(1). For example, the fish passage might be seriously jeopardized through incremental filling out to the navigation channel or the Bowerman Basin might be filled through a series of fills (over a long-term period) as has been the trend to fill westward. Generally speaking, it is easier to justify single, disparate projects which are consistent with local government land use plans than to address estuary wide cumulative effects. While this may be acceptable in minimizing local impacts, it is not possible to understand the cumulative effects of those individual fills until the next permit application is proposed and the sum of the projects may have an unacceptable impact on the resources. This leads to great uncertainty for both the agencies which issue permits or comment on them and developers in understanding how their development fits into the whole picture.

4. While the present regulatory system poses these problems for ensuring adequate protection of the natural resources, it also creates potential problems for those attempting to meet the socioeconomic needs of the community.

a. Just as case-by-case decisionmaking limits evaluation of cumulative environmental impacts, case-by-case decisions also limit evaluation of the cumulative effects of permit decisions on economic conditions. While denial of one project may not be critical to the economy, the cumulative effect of several permit denials may be very damaging. The present system also provides no means by which projects of potentially greater future need can be evaluated in the permitting process given the amount of developable space which is available. In other words, the present permit system provides no way of knowing whether it is allocating efficiently whatever development the system may be able to accept.

b. The present permit system is also unlikely to be able to achieve the optimum balance between environmental and economic needs. Since the case-by-case review system cannot effectively direct development proposals to the area of least environmental impact, the cumulative effect of individual permit decisions could result in a lower level of economic opportunity for a given level of environmental impact than if it were possible to direct development proposals, in advance, to the site most capable of accommodating those uses. By not optimizing economic opportunity in relation to environmental costs, the resulting balance would be lower than that which could otherwise be achieved. Also, without the GHEMP there are likely to be greater conflicts between economic uses, thereby usurping available spots with potentially inappropriate development.[1]

5. While the existing permit system has a distinct case-by-case review character, there are existing policy frameworks which seek to plan future use. The two major frameworks are local planning and zoning, and local SMP's. Neither of these programs has been able to establish predictability in regard to how the system should be managed. While each program can, and does, prevent or permit actions, other permit authorities can also prevent them because of the requirement to take additional considerations into account. Consequently, as discussed above, those programs do not provide a basis upon which future actions can be predicted. However, these policy frameworks do make up a part of the existing system which would continue under the no plan alternative. Therefore, it is necessary to address the environmental impacts which would occur under those plans rather than the proposed action.

a. Local Planning and Zoning

(1). The proposed GHEMP reduces the area in which urban uses would be permitted by the local plans and zoning ordinances. As such, the effect of the proposed plan would be to reduce the potential adverse environmental impacts of development patterns which current zoning would allow. The most significant reduction would occur in the Aberdeen/Hoquiam/ Cosmopolis area where a considerable amount of water and intertidal area is presently zoned industrial. The County's Comprehensive Plan also has more area designated industrial adjacent to these cities than the proposed GHEMP would permit. The present plan of Westport would extend urban uses into marshlands which would be protected under the GHEMP. Plans of the City of Ocean Shores would not be significantly modified by GHEMP, except for the reduction in area permitted for airport use.

b. Shoreline Management

(1). The potential adverse impact which might occur under the various existing SMP's is less clear due to diverse interpretations of provisions of those programs. For example, if it were assumed that the future uses under the Washington SMA would be limited to uses the SMA specifies as "permitted," the proposed GHEMP represents only a small reduction in the range of potential uses which could occur. However, if it were assumed that uses specified as "conditional" in the SMP's Conservancy Environments would be likely, the plan represents a dramatic reduction in the potential range and

1. For more information on some of the problems encountered with the existing regulatory system, see appendix E, which consists of an excerpt from The Federal Coastal Program Review.

degree of uses which could occur. Chapter 22, from the existing Grays Harbor County Shorelines Management Master Program, illustrates this point.

> Conditional Uses: The following uses are generally inappropriate or unnecessary shoreline uses in the Conservancy Environment. These and other unlisted uses may be allowed as conditional uses subject to the provisions of Chapter 33:
>
> Duplex; dwelling group; apartment; townhouse, condominium; hotel; motel; professional office; personal service; financial service; retail and secondhand sale; outdoor sales; vehicle and merchandise repair; campground; mobile home park; animal hospital; kennel; non-appurtenant signs; outdoor amusement; commercial parking lot; restaurant; tavern; water related industrial; water related commercial; marina; boat basin; boat sales and service; landfill; non-water related commercial use; non-water related industry; solid waste disposal; wood waste fill; public building; convenience goods sale; club, fraternal organization; service station; truck terminal; wrecking or junk yard; cemetary, school; church; mortuary; hospital; rest home; bulkheads and other protective devices; dredging and mineral extraction; pollution control facility; shake shingle mill; utility substation; power generating facility; airport; gravel crushing; asphalt or concrete batch plant; freeway, expressway; railroad; highway; log storage and rafting and golf course.

(2). With few exceptions, almost all such activities are neither permitted nor conditional uses under the GHEMP in Conservancy Environments. This should go a long way toward providing predictability in decisionmaking. GHEMP activities in Conservancy MU's are limited to water dependent/related uses, agriculture, farm houses and rural low intensity (scattered) house, navigational aids and linear facilities (roads, utility corridors) which require access to or through the waters. If past experience is an indicator of a possible future scenario, it appears highly likely that over the next 20-50 years the Conservancy environments as managed and designated under existing plans would be subject to more requests for conditional uses than would be allowed under the GHEMP.

(3). The proposed plan also alters the MU designations in the existing programs. The most significant change is a refinement in the Urban designation that currently applies to nearly all of the incorporated areas of Aberdeen, Hoquiam, and much of Cosmopolis. While the plan removes the Urban designation from most of the water area within the incorporated cities, it extends urban activities into parts of MU 12 and into the Junction City area somewhat further than the present County program. The benefit of the GHEMP is that it takes these important wetlands and uplands into account and affords them greater protection even though they are adjacent to an urban environment. A comparison between the existing SMP's and the proposed GHEMP is depicted in figure 6.

FIGURE 6
COMPARISON OF EXISTING LOCAL SHORELINE MASTER PROGRAM'S AND GHEMP

STANDARD USES

Note: If uses are treated same by both SMP's and GHEMP, then only GHEMP symbol is shown. If they differ, then "P", "C" or "X" is used. It is noted other uses are also permitted by SMP's which are not included in this figure.

ESTUARY MANAGEMENT PLAN — ● PERMITTED USE; □ SEE SPECIFIC MANAGEMENT UNIT GUIDELINES

	USE CATEGORY	NATURAL	CONSERVANCY		RURAL		URBAN			MANAGEMENT UNIT NO. 44
		N	CN	CM	RL	RA	UR	UD	UM	CM
PORT FACILITIES	Dock and Warehouse Facilities		C	C	P	P	□P	●	●	□
	Port Terminal Facilities		C	C	P	P	P	●	□P	□
	Ship Berthing		C	C	P	P	P	●	□P	□
	Barge Berthing		C	C	P	P	P	●	□P	□
	Ship Construction and Repair		C	C	C	C	P	●	□P	□
	Navigational Aids	□	□P	●	●	●	●	●	●	□
MANUFACTURING AND OTHER	Heavy Industry		C	C	C	C	P&C	P●C	P□C	
	Light Industry		C	C	C	C	□P	●	●	
	Water Dependent Industry		C	C	C	C	□P	●	●	□
	Forest Products Processing		C	C	C	C	C	●C	□	
	Mineral Extraction and Storage		C	□	●	●	C	●C	□	□
TRANSPORTATION	Ferry Terminal		P	□P	●	●	●	●	●	□
	Shipping		C	C	●	●	●	●	□P	□
	Roads and Railroads		□	□	●C	●C	P●C	P●C	P●C	
	Airports		C	C	□	□	□	●C	●C	
	Overhead Utility Corridor		□P	□P	●	●	●	●	●	□
	Submerged Utility Corridor		□P	□P	□P	□P	●	●	●	□
FOOD INDUSTRY	Commercial Fishing (Incl. Shellfish)	□P	●	●	□P	□P	P	P	P	□
	Oyster Culture	□X	●	●	□P	□P				□
	Aquaculture	□X	●	●	□P	□P	C	●C	●C	□
	Fish and Food Processing		C	□	□	□	□P	●	●	□
COMMERCIAL	Motel		C	C	P	P	●	P	●	
	Boat Sales, Construction and Repair		C	C	P	P	●	●	●	□
	Restaurant		C	C	●	□P	●	P	●	
	Marina		C	C	□P	P	●	●	●	□
	Other Commercial		P&C	P&C	P	P	□P	P	●	
RECREATION	Public Fishing Areas	●	●	●	●	●	●	●	●	□
	Water Dependent Hunting	●	●	●	●	●				□
	Pleasure Boating	●	●	●	●	●	●	●	●	□
	Camping		□	●C	●	□P	□P	P	□P	
	Public Boat Ramp		□P	●	●	□P	●	●	●	□
	Park/Parkway, Other Public Access		P	□P	●	□P	●	●	●	□
RESIDENTIAL	Floating Homes		C	C	P	P	□P	P	□P	□
	Urban/Suburban		C	C	P	P	●	P	●	
	Rural Low Intensity (Scattered)		P	□P	●	□P	●	P	P	
	Rural Agricultural (Farm House)		P	●	□P	●	P	P	P	
AGRICULTURE	Major Cultivated Crops		P	P	P	●	C	C	C	
	Passive Agriculture		P	●	●	●	C	C	C	
	Subsistence/Local Market Farming		□P	●	●	●	C	C	C	
	Tree Farm		□P	●	●	●	C	C	C	
NATURAL AREAS	Estuarine and Marine Sanctuaries	●	P	P	P	P	P	P	P	□
	Wildlife Refuges	●	●	●	●	P	P	P	P	□
	Living Resource Production and Habitat	●	●	●	●	●	●	●	●	□

EXISTING SMP's P = Permitted Use C = Conditional Use X = Not Permitted

(4). It is the collective judgment of local government representatives that current SMP's are more permissive to development (notwithstanding Federal permit requirements) over a long-term period than is the GHEMP. Local government representatives also believe that while they have given up some future development options to achieve comprehensive long-range planning which incorporates additional Federal standards and criteria, they will gain predictability on remaining more important development. While previous permit conflicts have been costly to developers because of delays, the record also indicates that most permits have been approved. The long-range picture would not likely change in the absence of the GHEMP. Therefore, the environmental consequences of no action are likely to be both more costly for particular development projects and more environmentally damaging than the proposed action.

c. Absent the GHEMP, local governments would make selective modifications to their local SMP's without the benefit of substantial Federal and State agency input provided by the Task Force. This could lead to a lack of balance if those changes are in response to future development pressure. This is to say, no action does not equate with no fill in the long-term future of the estuary.

6. Overall, the no action alternative would put greater pressures on local governments to allow urban expansion into the fish passage areas along the shoreline. Almost all projects which are contemplated by the plan including the projects at Ocean Shores, Westport, and the South Aberdeen industrial area are consistent with the existing local SMP's and local zoning and would be permitted by the local programs irrespective of the GHEMP. The major exception would be the development activities in MU 12. Development in Bowerman Basin would not be consistent as a permitted activity, but nonetheless might be allowed as a conditional use. In the GHEMP, the Standard Use Matrix does consider port, manufacturing and transportation facilities as a "permitted" use in the UD MU environment, but all activities in the MU are "special condition" activities and not designated as "permitted."

a. Under the no action alternative, 1700 acres wetlands - now Port property - would not be transferred to the Washington State Department of Game for preservation. Development could well take place within and beyond the 500 acres currently proposed in the plan over the next 50 or even 100 years. No mitigation would be guaranteed. The Port could opt to restore diked wetlands as in-kind replacement, but that would not necessarily benefit the shorebird population that uses the basin. While the actual demand in year one may not be great for additional land along the navigational channel, the demand will be great in future years due to a number of variable circumstances including the widening and deepening of the navigation channel and economic recovery.

b. Conversely, because of the importance of the Bowerman Basin to the shorebirds and falcons, it is possible Federal laws and regulations would effectively prohibit future fill despite political and development pressure. This assumes that environmental laws and regulations would not be weakened and that the considerable pressures associated with economic development do not prevail.

c. This evaluation cannot accurately predict the outcome of the future for the Bowerman Basin under the no action alternative. It would be speculative at best. One thing is clear: there is a substantial likelihood of some portion of MU 12 being filled for development during the next 50 years.

D. ALTERNATIVE PLAN CONCEPTS

1. Any plan is a composite of actions for each of which there are a number of alternatives. It is not possible, within the scope of this document, to identify and describe at length each of the alternatives for specific proposals which were considered during the process. However, it is possible to discuss the general concepts of such alternatives. In the development of the plan, alternatives were discussed at each level of policy development. Alternative goals were discussed before the proposed GHEMP was selected. Potential, alternative scenarios for each set of planning area guidelines were formulated. Alternative designations then were discussed as each unit was assigned a management category. Each of these discussions tended to involve the following policy directions in comparison to the policy balance now contained in the plan:

- o Policy or use commitments which provide greater development opportunity but would result in greater resource loss.
- o Policy or use commitments which would provide greater protection for the resource by greater restriction of development opportunity.
- o Policy or use commitments which would address the distribution of activities, such as: a) concentrating development with its potential impacts into fewer but more intensely used areas and b) dispersing development over wider areas but with less intensity.
- o Policies which would direct the pending urban uses to other areas: a) away from the estuary; b) to other areas in the estuary; c) to other ports.

In all, the consensus decisionmaking process served to narrow down the viability of many of the alternatives.

2. The following discussion will consider alternative plan concepts and describe the potential environmental effects that would occur if more proposals in the plan were made under each of these alternative policy directions.

a. Greater Development Opportunity with Greater Environmental Costs

(1). The planning process could enable more decisions which would increase the (apparent or desired) opportunity for local governments to enlarge their economic base. While this alternative could provide greater potential economic benefit to the area (by allowing more fill for industrial/commercial development), it also would significantly increase the potential for substantive modification of the estuarine system and human environment of the shoreline. Each such modification would entail further loss of productive estuarine area. The balance between development opportunity and environmental costs was extensively discussed, debated, and resolved throughout each stage of the planning process. The goal formulation stage considered the following concept:

> Manage Grays Harbor for intensive industrial use and protect Willapa Bay for resource management purposes.
> (Note: In 1977, the Corps made a final determination that there would be no more maintenance dredging in Willapa Bay, and that log exporting would ostensibly go to Grays Harbor. See appendix E, p. 2, article on Willapa Bay: An End to Dredging.)

(2). This concept, if it were selected, would have conditioned later planning decisions to be conducive to permitting more development opportunity than the proposed plan. It also would have resulted in a greater number of provisions in the plan to permit modification of the estuarine system. The present overall goal tries to avoid this extreme position and encourage a balance between economic need and environmental costs.

(3). In the consideration of Planning Area Guidelines, the potential of each Planning Area to support greater use for various socioeconomic purposes was considered. In all Planning Areas, the guidelines which were selected tend to constrain the potential development which might otherwise result, in order to conserve and protect important environmental resources.

(4). As each planning unit was considered in the process, various specific proposals were also considered which would have resulted in greater adverse impacts on the natural system. While many such proposals were rejected, some of the more significant ones included:

- Retention of Urban designation on all shorelines in Westport,
- Larger airport and support facility area at Westport,
- Larger airport at Ocean Shores,
- Greater residential opportunity along North and South Bays,
- Allowance of some industrial development of North Bay,
- Use of Unit 12 (1700 acres west of Bowerman Basin owned by the Port of Grays Harbor),
- Leaving Bowerman Field where it is and permitting expansion into the adjacent tideland,
- Allowing the filling of Units 12 and 14 to the navigation channel line, especially development of the old "fish base,"
- Having the ability to fill larger areas along the Aberdeen waterfront,
- Immediate extension of Urban Development further up the Chehalis River,
- Allowing intensive development on the channel along the south waterfront of Aberdeen,
- Permitting greater industrial and commercial use of the area upstream from Cosmopolis,
- Providing a larger Urban Development area near Markham and allowing bankline straightening, and
- Providing areas (such as that near Rennie Island) for in-bay disposal of dredge material.

(5). These alternatives for providing greater development opportunity generally are not provided for in the plan because their impact, when combined with the modifications permitted, is expected to produce unacceptable cumulative adverse environmental impacts. As more and more modification is permitted the potential to impair the productive capacity of the system becomes greater. Other, more specific concerns for rejecting these proposals included, but were not limited to:

- Discouragement of urban sprawl and haphazard development,
- The especially significant concern of protecting the fish passage,
- The need to ensure protection of critical or particularly important natural features, and
- The need to conserve productive marsh area for marine production.

b. Less Development and Greater Resource Protection

(1). The process could result in a plan which would permit less development opportunity than the proposed plan. By so reducing the amount of modification to the shoreline and estuarine system, there would be greater assurance that the essential biological function of the system would not be impaired. Particularly significant, less conversion of wetland to upland would thus occur. Such environmental protection, however, would be at the cost of prohibiting future regional economic development which the local government representatives on the Task Force believe to be below the "bottom line" of what they think is reasonable or desirable from a long-term perspective. As in the case of the greater development alternative, decisions of this nature occurred often during the planning process. When the proposed goal for estuarine management was selected, the Task Force also considered the following concept:

> Manage Grays Harbor for maximum resource protection, by severely limiting filling, and limiting development to existing industrial land. (Note: A distinction must be made between what is zoned industrial but not developed and what is currently industrial land as a matter of fact.)

(2). This concept would direct further decisions in the planning process toward greater conservation of the estuary; it also would prevent the planning process from adequately addressing the importance of the system in providing opportunities to meet the perceived long-term economic needs and desires of the area.

(3). The planning process also considered instituting Guidelines in each Planning Area which would place greater constraints on the opportunity for more intense use of the estuary. Such Guidelines would produce more cautious management decisions in the future and thereby serve to conserve more environmental resources than the present Guidelines. Likewise, such guidelines might also frustrate the achievement of perceived socioeconomic needs and growth.

(4). This alternative would allow no wetlands filling in MU's 6 (Ocean Shores), 12 (Bowerman Basin with exception of peninsula), 26 (98 acres of the south shore industrial site, 38 and 39 (Westport Airport and Marina); but would allow the use of vacant or underutilized lands in order to meet the region's socioeconomic needs: This alternative would have fewer natural resource impacts and potentially meet some of the region's economic needs. As discussed below, some of the spatial or other support requirements provided by the existing developed or developable lands may not meet the future demands for maritime industrial needs.

(5). As part of the scoping process, OCRM and the Task Force have received an alternative to the GHEMP entitled the (draft) Citizen's Grays Harbor Estuary Management Plan submitted on January 15, 1983 by a number of national, regional and local environmental and conservation organizations. These organizations include:

- o Natural Resources Defense Council
- o Friends of the Earth
- o Washington Environmental Council
- o Seattle Audubon Chapter
- o Tahoma Audubon Chapter
- o Black Hills Audubon Chapter
- o N.W. Steelheaders - Grays Harbor Chapter
- o N. Beach and Pacific Co. Environmental Council

The draft alternative was submitted because the organizations "do not find that the proposed Estuary Management Plan developed by the Task Force has arrived at an acceptable 'balance' between environmental and developmental objectives." While the entire text is included in appendix F, the major provisions are set forth below.

Citizen's Grays Harbor Estuary Management Plan [1]

2. Key criteria of the Citizen's Estuary Plan include the following:

* Acceptance of the Estuary Management Goal for the Estuary which says that "the Grays Harbor estuary will be managed for multiple uses."

* Equally important, however, is the retention of the tests of water dependency and feasible alternatives analysis as the basis for estuary development decisions, and

* Increased protection for natural parts of the estuary.

1. Direct Quotation

3. Based on these criteria, certain elements in the Task Force plan are rejected:

a. Filling 73 acres of tideflats, wetlands and intertidal area north of the Bowerman Airfield in the Unique Wildlife Bowerman Basin ecosystem by the Port of Grays Harbor in M.U. 12.

This fill is rejected because its purpose is not water dependent (i.e., airport relocation), it would have an unacceptable adverse impact to the estuary and no inkind replacement habitat mitigation is proposed.

b. Filling 164 acres of tideflats, wetlands and intertidal area west of the Bowerman Airfield in the Unique Wildlife Bowerman Basin ecosystem by the Port of Grays Harbor in M.U. 12.

This fill is rejected because it would have an unacceptable adverse impact to the estuary and no inkind replacement habitat mitigation is proposed.

c. Filling 20 acres or wetlands north-east of the Bowerman Basin ecosystem by the City of Hoquiam in M.U. 14.

This fill is rejected because its purpose is not water dependent, it would have an unacceptable adverse impact to the estuary and no inkind replacement habitat mitigation is proposed.

d. Filling 95 acres of freshwater wetlands as a dredge spoil disposal area by the Port of Grays Harbor in M.U. 26.

This fill is rejected because feasible alternatives exist (i.e. open water disposal) and no inkind replacement habitat mitigation is proposed.

e. Filling approximately 40 acres of tideflats, wetlands and intertidal area east of Ocean Shores by the City of Ocean Shores for an airport in M.U. 6.

This fill is rejected because its purpose is not water dependent; despite the fact that inkind replacement habitat mitigation is proposed.

f. Filling of an unspecified amount of acres of wetlands to expand an existing airport by the City of Westport in M.U. 38.

This fill is rejected because its purpose is not water dependent and no inkind replacement habitat mitigation is proposed.

g. Filling of an unspecified amount of acres of wetlands to expand an existing marina by the City of Westport in M.U. 39.

This fill is rejected because of lack of need and no inkind replacement habitat mitigation is proposed.

4. Since one of the key concepts in the Citizen's Estuary Plan is increased protection for natural parts of the estuary the following additional protective features must be included:

* Sec. 404 (c) designation under the Clean Water Act for areas unsuitable for dredge or fill disposal.

* Recognition of the U.S. F&WS's endangered species determination under Sec. 7 of the Endangered Species Act that filling in 500 acres of the Bowerman Basin would likely jeopardize the endangered Peregrine Falcon and management of the area as an International Shorebird Sanctuary.

* The establishment of a mitigation plan in place prior to adoption of an estuary plan.

* Commitment to a sediment control study as part of any Dredged Materials Disposal Plan prepared by the Task Force.

* Ocean side management units established and adopted as part of any estuary plan for Westport and Ocean Shores.

5. The Citizen's Estuary Plan accepts and utilizes the basic political management unit divisions and categories which the Task Force has established. However, it reorders the priorities and assumptions under which development, especially by the Port of Grays Harbor, can take place.

In particular, a finding is made that the Port of Grays Harbor has currently at its disposal:

a. a 176-acre dredge spoil disposal site which is undeveloped and for which no inkind replacement habitat mitigation was carried out by the Port in M.U. 26.

b. a 45-acre (Kaiser Steel) site, speculatively filled by the Port in 1977, which is still undeveloped and for which no inkind replacement habitat mitigation was carried out in M.U. 15.

c. a 72-acre site at the Port's Terminal 2 in M.U. 15. Thus, a total of 293 acres of shoreline area accessible to the navigation channel is available to the Port of Grays Harbor. If the 600 additional acres of potential filling allowed the Port by the Task Force were carried out, nearly a thousand acres of developable land would be placed at the disposal of the Port. We reject this approach to Port development. We do not find in the Task Force's plan any requirements that the Port's existing land development listed in 5. a.-c., above, must be utilized first before additional filling is permitted.

6. Therefore, the Citzen's Estuary Plan recommends a three phase plan as follows:

a. Phase I - The Port has 293 acres of development potential. These areas must be developed to the satisfaction of the Task Force and a citizen advisory committee to their fullest potential for water dependent purposes.

b. Phase II - The next development opportunity with the least environmental cost is utilization of the Bowerman Peninsula (approximately 200 acres) with a small amount of filling permitted in the south-west corner to align area with navigation channel. This however, will require the Port to relocate their Airport outside the estuary at one of three sites:

1. Central Park
2. Markham
3. Elma

as set out in the Bowerman Field Relocation Planning Study, June 1979, Grays Harbor Regional Planning Commission.

Thus, the Port must make a tradeoff as to whether the economic benefits of utilizing the Bowerman Peninsula for water dependent uses exceed the costs of relocating the airport.

c. Phase III - After the completion of Phase I and II to the satisfaction of the Task Force and a citizen advisory committee a further in depth examination would be made to amend the Grays Harbor Estuary Management Plan to accommodate an additional 250 acres of fill someplace in the estuary. (This is the same process as set out for Area 4 in M.U. 12 in the Task Force's draft plan.)

Thus, further decisions and additional filling for specific water dependent projects would be dealt with through the plan amendment process. Under the Citizen's Estuary Plan, the Port of Grays Harbor would have 500 acres available to the Port for water dependent development in Phase I and II and the potential for an additional 250 acres in Phase III with minimum impacts to the Grays Harbor estuary.

7. Because the Task Force's plan provides little in the way of additional protections for important natural areas in the estuary the Citizen's Estuary Plan proposes the following:

a. The following 11 Management Units are recommended for designation under Sec. 404 (c) of the Clean Water Act as areas prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U.'s 2, 7, 9s*, 19, 20, 29s*, 34s*, 36s*, 27s*, 41 and 42. These M.U.'s are all designated Natural or Conservancy Natural ("*" s means the shoreline part of a split mangement unit).

b. The following 4 Management Units are recommended in part for designation under Sec. 404 (c) of the Clean Water Act as areas prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U. 's 12, 14, 18, 26.

c. The following Management Unit is also recommended for designation under Sec. 404 (c) of the Clean Water Act as areas prohibited by the Adminstrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U.'5. This M.U. is designated Urban Residential.

d. In addition, 9 Management Units are recommended for the Sec. 404 (c) process of notice and comment without a specific determination made at this time.

The suitability of the following Management Units would be assessed during this process:

M.U. 's 1, 3, 22, 23, 27, 30, 40, and 43. These M.U. 's permit only bankline erosion control fills in the Task Force plan.

Thus, a total of 25 M.U.'s or parts of M.U.'s could be protected by such a finding by EPA under Section 404 (c).

Sec. 404 (c) designation would of benefit for two reasons:

* It would clearly identify areas in which future filling may be contemplated but has not been brought to the attention of the Task Force. Since the 9 M.U.S. listed in 7. d. above, conflict only with the bankline erosion control feature, we would like EPA to examine the tradoffs of foregoing erosion control for protection from filling in these areas.

* It would clearly identify areas in which future filling would not be allowed by the Corps of Engineers.

Appendix B contains a description of each of the M.U. 's listed above.

8. Recognition of the U.S. F&WS's endangered species determination under Sec. 7 of the Endangered Species Act that filling in 500 acres of the Bowerman Basin would likely jeopardize the endangered Peregrine Falcon. This determination should be incorporated into the final plan. In addition, the Bowerman Basin would be designated and managed as an International Shorebird Sanctuary. See Appendix C.

9. The Task Force with the help of a citizen advisory committee would establish a mitigation plan to require inkind replacement of habitat for any wetland, intertidal, or tideflat area filled under an adopted plan. This mitigation plan should be in place prior to adoption and incorporated into the final plan.

10. The Task Force would commit to undertaking a sediment control study as part of any Dredged Materials Disposal Plan prepared by the Task Force. A request for such a study was specifically made by then-Governor Dan Evans in 1973. Since that time, the Corps has prepared a literature review, but no in depth study has been carried out to comply with Gov. Evan's request. Control and reduction of sediments in the Chehalis River Basin could significantly reduce the amount of sediment which needs to be dredged, thereby reducing the pressure on wetland, intertidal and tidal flat filling, especially for maintenance dredging.

11. The Citizen's Estuary Plan also calls for the Task Force with the help of a citizen advisory committee to develop Management Units for ocean side coastal zone in and around the cities of Westport and Ocean Shores. These coastal areas are important and should be addressed within the context of this plan.

12. A Citizen's Advisory Committee would be established by the State Dept. of Ecology to ensure that the public is permitted to participate in the development of any revised plan or plan amendments.

(end of quotation)

(a). Evaluation. The Task Force has been provided copies, but has not convened for full review of Citizen's Estuary Plan. A complete evaluation will be made on the merits of the alternative after all comments have been received during the public review process and incorporated in the PFEIS.

(i). The overall impact of the alternative is to provide less development potential while providing greater protection to the wetlands, fish and wildlife resources than the proposed GHEMP.

(ii). While accepting the basic tenents of the plan, it rejects all of the major provisions in which compromise solutions to the issues of future growth and protection were formulated on the basis that:

- o the intended use would not be water dependent (airports),
- o there is no current or demonstrated need (marina expansion),
- o there is no in-kind habitat replacement proposed, or
- o that the impacts are considered to be unacceptable.

(iii). The Citizen's Plan:

o requires the location or relocation of three airports outside of the estuary area,

o would allow no future expansion of the Westport Marina,

o would not allow fill for industrial expansion in the Port owned lands in MU 12 (note: It is not clear expansion would be permitted at some future time or not. The Citizen's Plan states that filling is rejected because of unacceptable adverse impact to the estuary but then may permit fill during Phase III - i.e., after all existing space is utilized to the satisfaction of the Task Force and a citizen's advisory committee.), in the City of Hoquiam's land in MU 14, and in the 98-acre site in MU 26,

o invokes §404(c) of the Clean Water Act on all or parts of 25 MU's in order to provide additional protection to natural areas,

o requires the incorporation of a previous F&WS determination (13 March 1981) that filling the entire Bowerman Basin (500 acres north of the airfield) is likely to jeopardize the continued existence of the peregrine falcon, and that filling westward may do the same,

o requires the re-evaluation of permitting bankline erosion control activities in specific MU's,

o requires a sediment control study in efforts to minimize the need for maintenance dredging (and pressure for filling aquatic habitat),

o calls for maximizing the utilization of existing developable land (Phase I) prior to allowing any further filling (Phase III),

o establishes in-kind habitat replacement as the only form of acceptable mitigation, and

o requires establishment of a citizen advisory committee for the purpose of setting up a mitigation plan, planning for ocean side coastal environments of Westport and Ocean Shores, and involvement in the plan amendment process.

(b). The Citizen's Estuary Plan alternative is accepted as a viable alternative with three exceptions which will not be considered as viable or necessary to the GHEMP proposal. Those items specifically rejected include:

(i). Item 9. The establishment of a Mitigation Plan which must be in place prior to adoption of the GHEMP. It is premature to develop a Mitigation Plan prior to the adoption of the GHEMP. The draft GHEMP is subject to modification and will provide the framework for the Mitigation Plan. Any mitigation required prior to development and adoption of a Mitigation Plan will be considered through the existing permit process. A Mitigation Plan would be incorporated into the GHEMP through the amendment process. The Task Force would develop such a plan within the first or second year after adoption. Additionally, "in kind" replacement of habitat may or may not be a part of the future Mitigation Plan requirements for every development. As discussed at GHEMP pp. 26-27, a Mitigation Plan would address the three mitigation concepts identified in the plan or whatever exists after the public review process.

(ii). Item 10. Undertake a sediment control study as part of any Dredged Material Disposal Plan prepared by the Task Force. Such a study was undertaken in 1974 and is entitled: Grays Harbor Erosion Management Study (by Norman Associates for the GHRPC). The Study is available for review through the GHRPC. Further duplication of effort is considered unnecessary.

(iii). Item 11. Develop MU's for the ocean side coastal zone environments in and around the cities of Westport and Ocean Shores. Without disputing that these areas are important, the emphasis of the GHEMP is the immediate area surrounding the estuary in which the major land and water use conflicts arise and have a direct impact on the estuary. While many different boundary configurations are possible, the Citizen's Estuary Plan fails to make a case why the ocean side environments must be a part of the estuary plan.

(c). The Citizen's Estuary Plan includes a number of assumptions and statements whose premises are subject to dispute:

(i). Wetlands filling should be permitted only if a project is water dependent and in-kind habitat replacement mitigation is required. While perhaps desirable from a wetlands protection perspective, these standards are more restrictive than existing Federal agency Guidelines and Regulations for filling wetlands. The Corps considers many other factors through the permit process and public interest review in addition to water dependency.

(ii). That there is a need to incorporate into the final GHEMP the March 13, 1981 U.S. Fish and Wildlife Service Section 7 consultation letter which states that filling 500 acres directly north of the Bowerman Peninsula as proposed in the earlier draft plan is likely to jeopardize the continued existence of the peregrine falcon. The earlier concern was primarily directed at the location of the fill more than the amount of fill. The area north and northeast of the Airfield was considered to be the most significant as shorebird habitat and consequently, the integrity of the falcon's existence. The plan thoroughly considers that determination. On that basis, the plan proposes a new configuration of fill, phasing development to permit monitoring of impacts, mitigation requirements, and the permanent land exchange protecting 427 acres of the 500 acres. The U.S. Fish and Wildlife has since issued a new determination that the current plan is not likely to jeopardize the continued existence of the endangered peregrin falcon (see appendix C). If Area 2 is filled, the Bowerman Basin will be turned over (through fee title transfer of lands) to the Washington State Department of Game thereby permanently preventing fill of the shorebird habitat which is most critical to the prey species of the peregrine falcon.

(iii). That the GHEMP does not have any requirement that the Port's existing filled lands on south shore (176 acres), the Kaiser site (45 acres) and at Terminal 2 (72 acres) must be utilized before additional filling is permitted. With respect specifically to the Port of Grays Harbor lands, the plan does make such specification for filling Area 3 (GHEMP, p. 65, item 2) and Area 4 (GHEMP, p. 67, item 3). Since we are dealing with long term activities, most of the subject lands are likely to be utilized or committed prior to the complete development of Area 2.

(iv). That the Airport Relocation Study concluded alternative sites for a regional airport are available in Central Park, Markham and Elma. The "Findings, Conclusions and Recommendations" of the Study (p. 97) state the following:

> Realistically there is no opportunity to locate a new Basic Transport Airport in the 1,200 square mile study area that would readily serve the population base and be environmentally and economically prudent to develop. There are however, opportunities in the area to locate a General Utility category airport <u>to help relieve</u> the developing operational pressure at Bowerman Field and to better meet the region's aviation demand. (Those sites include Central Park, Markham and Elma, emphasis added).
>
> From a systems planning and cost-effective viewpoint, all efforts should be made to make the existing Bowerman Field site as compatible with the Estuary Plan as possible to avoid the relatively high capital outlay for a new airport site.

c. Distribution of Impact Alternatives

(1). In addition to the alternatives dealing with the overall level of activity to be permitted, there are alternatives which would distribute this activity in different patterns. The planning process considered these issues mainly in its development of planning area guidelines where generally appropriate levels of development were determined for each area. The result of these guidelines is a relatively concentrated pattern of urban and natural use areas based largely on the existing character of various planning areas.

(2). The issue of whether the adverse environmental impact can effectively be reduced by dispersing or concentrating development is frequently discussed in estuarine management situations and is seldom completely resolved. In the Grays Harbor planning process, these allocation decisions were made more on the basis of the existing character of an area and the most practicable way of both protecting important environmental features and meeting socioeconomic needs, than on the achievement of a philosophical goal to disperse or concentrate development of natural uses. Nevertheless, the planning process addressed such alternatives and considered their implications.

(3). Dispersed Development

(a). It can be argued that better environmental protection can be achieved by dispersing development over a broad area, thereby avoiding a synergistic effect of development activities. This argument suggests that greater levels of development can be supported with fewer environmental costs by spreading the impacts. This is perhaps more true for water and air quality issues than for wildlife resources.

(b). Theoretically, it could be possible to take the level of impact addressed in the plan and distribute it over a wider area. For example, rather than concentrate new water dependent industry in Aberdeen/Hoquiam, it could be spread more uniformly and less intensively throughout the estuary. While theoretically possible, this alternative poses significant practical problems. Each development project is tied to a particular need or a particular potential opportunity, and in most cases this need would be less adequately addressed in another location. In some situations, dispersion would greatly increase public utility and service costs to serve such areas. This policy could stimulate the spread of urban development along with resultant infill.

(c). More significant than these concerns is the relationship of this policy to environmental conditions in the Grays Harbor area. Historically, the urban growth of the area has been relatively concentrated in the Aberdeen/Hoquiam and Cosmopolis area, and to a lesser extent in Westport and Ocean Shores. The remaining areas of the estuary are largely undisturbed by development activity. This alternative would change the development pattern and introduce new impacts into natural or nearly natural environments. But the largest limitation to dispersing shoreline development is providing access to the navigation channel for marine commerce development.

(d). Areas which might, however, serve as future urban development areas for industrial siting of water dependent/related activities would be MU 3-CM (Damon Point) which is located near the North Channel, MU 27-RL (Stearn's Bluff) and MU 10-RL (Point New).

(i). The Damon Point area would require additional fill and protective structures and destroy significant bird habitat. It would have substantial transportation problems associated with getting wood products or other commodities to a shipping site and be located very near MU 2 which is a Natural area.

(ii). With respect to MU 27 near Stearn's Bluff on the south shore, it would be conceivable that industrial development could expand, given the fact it has highway and rail access and relatively flat land. This would require opening a portion of the South Channel which has been left unmaintained for many years. Industrial expansion would substantially alter the land use pattern of the area and require sewer and water hookup and possibly introduce water quality problems where they now do not exist, which could adversely affect existing oyster culture areas.

(iii). The Point New area has a substantial amount of flat land with both highway and rail access. Development would require either a new navigation channel or transportation of goods and services to other existing docks for loading. The site could serve as an industrial park for nonwater dependent uses if filling is not required. This would introduce industrial activities into the North Bay area which is one of the actions the GHEMP has attempted to avoid.

(e). In conclusion, dispersing urban development into the more pristine areas of the estuary would have substantial negative ecological and economic consequences. In addition, the concept of dispersion is not consistent with the provisions of the Washington SMA.

(4). Concentrated Development

(a). In contrast to a policy of dispersion, this policy would concentrate development into few areas and reserve most of the estuary for more natural, less intensive uses. Current local SMP's tend to support this policy even more than the proposed plan. As an example, the SMP's for Aberdeen and Hoquiam would allow greater modification of the waterfront areas. Fishery experts have stated that this level of development could significantly impair the passage of anadromous salmonid fish through this area and as such poses an unacceptable level of impact.[1] Thus, the plan tends to protect this passage by establishing greater limits on the potential intrusion of development into waterfront areas.

(b). As an alternative to filling in MU 12 and the western part of MU 26 (in order to stop the westward expansion of development and concentrate development in the Aberdeen/Hoquiam area), MU 43-CM (Rennie Island) and part of MU 26 (salt water marsh) would allow good access to the navigation channel (see photo 2). However, because there is no access to the island from either the north or south shore, a bridge would have to be built to allow industry to locate there; other modifications would be required as well. The island has been heavily modified by previous dredge material disposal but is a good habitat for a variety of fish and wildlife. The area is perhaps unique in that it will continue to serve as a limited dredge material disposal area but provide a long-term use for wildlife and waterfowl habitat enhancement.

---

1. See fishery impacts section, page IV-14.

Photograph 2.
Rennie Island looking S.E. from mouth of the Hoquiam River

(c). The alternative of greater concentration also embodies the concept of more efficient utilization of existing space. Waterfront space which has been altered or has access to the navigation channel can be reserved exclusively for water-dependent uses, including run down areas or areas not used to their maximum capacity. While land ownership by marine or private industries would be a problem, port expansion demands may be met for a longer period of time, thereby delaying the need for future fill if the spatial requirements of new industry can be met. In many cases, this would only be feasible if expansion towards the navigation channel is permitted. There are, of course, potential hazards to the fish base and passage as pointed out above.

d. Relation of Impact Alternatives to Industrial Development

(1). Finally, there is a set of alternatives related to industrial development in general, and to the Bowerman Basin area in particular. Local government representatives and the Port of Grays Harbor believe that the Bowerman Basin area can best represent the industrial expansion and diversification needs of the region's future and, therefore, embodies the need to provide adequate space for industrial development. Consequently, alternative space for this purpose should be considered. There are two possibilities for such space: areas located away from Grays Harbor and other areas in the estuary.

(2). Non-Estuarine Areas. Suitable industrial land is a scarce commodity and has several requirements:

(a). Spatial Requirements. Modern industrial plants require large areas not only for present use but for future expansion. Planning design criteria generally recommend that areas for industrial parks siting (the preferred method of handling industrial uses) have at least 320 acres.[1]

(b). Flat Land. Slopes generally cannot exceed 6 percent.

(c). Services. The site must be served or be capable of being served by adequate rail and highway systems, have access to large quantities of water, and be served by waste disposal systems as well as by other utilities.

(d). General Location. Within major commuting distance but far enough apart to minimize adverse impacts to residential and commercial areas.

(e). Considering these requirements, there are few locations within the region which can supply these needs. Other than sites in and along the estuary, the only other potential sites are areas near the small cities in the Chehalis Valley, although water and sewer services in those cities generally would need substantial development to meet industrial needs. Such locations would have several serious disadvantages, including:

---

1. Industrial Development Handbook, Executive Group of the Industrial Council of the Urban Land Institute, 1975, Wash. D.C., pp. 29-31.

- o They could threaten fish and wildlife habitat found in the valley.
- o Their location in flood hazard areas,
- o The conversion of agricultural land,
- o Their presence would constitute a major alteration of land use patterns in the region,
- o They would require greater employee commuting,
- o They could stimulate greater urban sprawl.

(f). However, the greatest difficulty with these sites is that they do not relate to the most significant comparative advantage of industrial siting in Grays Harbor - its access to a deep water channel. The sites in the valley are removed from this potential. Finally, due to its established infrastructure, the Aberdeen/Hoquiam/Cosmopolis area is generally more able to accommodate new industrial development than would be the smaller cities in the valley which lack most of the services and facilities required by industry.

(3). Other Sites in the Estuary

(a). If industry is to locate on the estuary, where is the most suitable location? In order to answer this question, several criteria (in addition to those above) should be established:

- o The industry should have access to deep water;
- o Industrial access should be economical and minimize upstream movement of vessels;
- o The sites should be readily serviceable by rail, street, water, sewer, and other utilities;
- o The sites should be near other public and private services needed for business operation;
- o The industrial use should minimize conflict with adjacent uses and the land should be generally appropriate for industrial use; and,
- o Industrial siting should minimize potential adverse environmental impacts.

(b). On the basis of the above criteria there are only three viable alternatives for new industrial siting - Bowerman Field, South Shore (MU 26), and the area upstream from Junction City and Cosmopolis. South Shore is a significant distance from the channel. In order to use the channel, the industry must construct conveyance facilities to the channel (as in the case of bulk commodities such as coal or feed grain) or move cargo (such as logs or lumber) to other transshipment sites. The first alternative is considered to be the most practicable. In order to make the South Shore area

viable as an all-purpose related site, substantial modification of the adjacent salt marsh on the bay side of the railroad would be necessary, and this action could seriously threaten the quality of the fish passage. Use of the City area further up the Chehalis River would require significant modification of the natural area of mixed freshwater marsh, salt marsh, and low forest types. The site also has poor highway access. The GHEMP would permit only a limited amount of industrial development to occur in this area (MU 18).

(c). The Bowerman Basin area has the best combination of these criteria including immediate adjacency to the navigation channel and its appropriateness for large-scale industrial siting. To quote from the plan:

> In establishing its direction for overall management of the estuary, the Task Force recognized that economic growth involving conversion of natural habitat to industrial uses would continue at some level in the harbor during the life of this plan. In reviewing the opportunities for that growth to occur around the harbor, the Task Force reviewed the several potential areas in terms of the availability, size and usability of land, transportation access for both rail and highway, proximity to the main navigation channel, availability of utilities, relationship to the existing industrial areas, relationship to other support industries and uses and other factors. While there are several areas around the harbor that could accommodate some industrial growth, the Task Force saw that most provided only limited opportunities. In pursuing a philosophy of concentrating major future development rather than dispersing it throughout the harbor, focusing that growth into the area of Management Unit 12 met more of the criteria than any other area. (GHEMP, p. 63)

(i). While having adverse impacts to the shorebird habitat, siting (with respect to future filling) is considered not to have an unacceptable impact on the aquatic ecosystem including wetlands. Once again, quoting from the plan:

> In addition to criteria directly related to the needs of future industrial development, the Task Force considered the amounts of various types of intertidal habitat and their values to fish and wildlife resources. Fish migration habitat was considered a major limiting factor in Grays Harbor because of past development patterns. During the next 50 years, the plan, as drafted, will protect most of the estuarine wetlands from filling except those in this management unit. This is approximately 1.5% of the intertidal area of Grays Harbor and 6% of the estuary's low silty marsh. Although there is an adverse impact associated with filling these wetlands, the balance achieved through protection of most of the rest of the estuarine ecosystem from filling reduces the significance of the loss, and is consistent with the overall goal for management of the estuary for multiple uses. (GHEMP, p.62)

The plan then lists the reasons why filling of parts of MU 12 is considered acceptable within the context of the plan and the total estuary.

(4). Other Ports

(a). The alternatives analysis must also consider the capacity of other ports in the vicinity of Grays Harbor to handle the needs created by future port demands, with less filling of wetlands or other environmental impacts. Both alternatives to filling and needs for filling for major water-dependent industrial sites can only be realistically evaluated on a long-term comprehensive basis. On that basis, as the projections below indicate, there will be an expanding need for industrial sites, particularly for forest products related facilities. Previous evaluations, cited below, also indicate other ports do not provide viable alternatives for shipping Grays Harbor forest products.

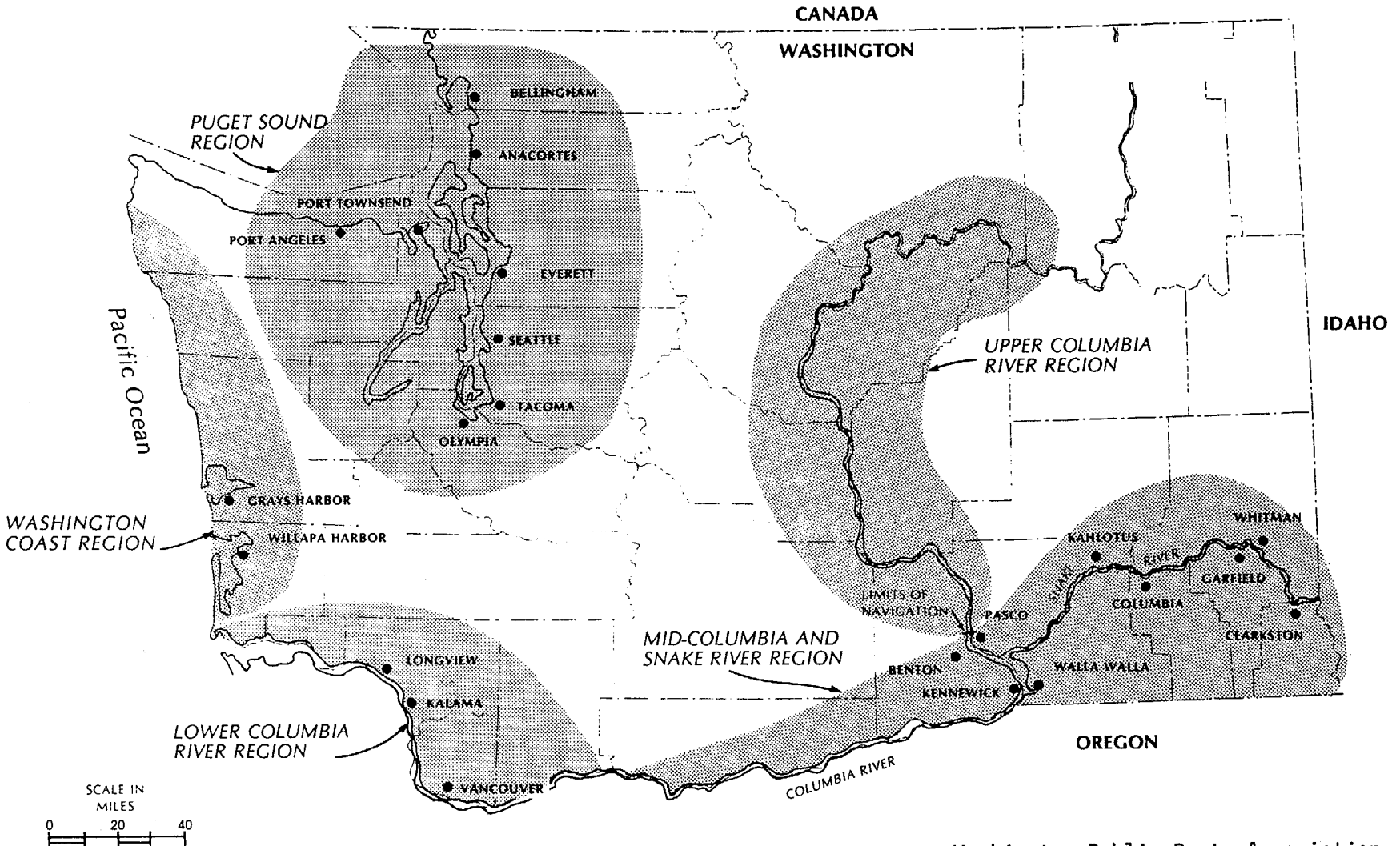
(b). Long-term analysis, data and evaluations identified in (c) below, support the conclusion that there will most likely be a valid and legally recognizable "need" for considering future fill for major water-dependent industrial sites in Grays Harbor, even in the absence of currently identifiable site-developers, certainly as to forest products facilities and quite probably as to other development (coal, grain, etc.). Other ports on the Washington coast may or may not be able to provide better alternatives to satisfy those needs. Naturally, complete evaluation of needs must be addressed and confirmed through the regulatory process at the time of permit application.

(c). Projected future port/industrial demand.

(i). Forecasts on port facility demands for the area are provided by the Washington Public Ports Association. In their "1980 Port Systems Study for the Public Ports of Washington State," Vol. II, Part 3, they state the following with respect to the overall projected needs for the Washington coast region (Grays Harbor specifically) in relation to other port sites (see figure 7 for Port Study Regions).

> In the Washington coast region, all the shoreline currently owned by the ports will be developed by 1995, and by the year 2000 a deficit of approximately 3,250 linear feet of shoreline and 115 acres is forecast. On the basis of these findings, there appears to be sufficient need for additional shoreline property in the Washington coast region to support an acquisition program. Such an acquisition program would need to be more extensive if facilities for coal or grains are to be developed. (p. 1-2)

> A potential for Washington ports to handle over 25,000,000 ST [short tons of coal] by the year 2000 has been identified. Handling this quantity of coal would require either three or four berths, depending on locations. The optimum arrangement would appear to be one two-berth terminal in either the lower Columbia or Washington coast region and another in the Puget Sound region ..... The assumed typical coal terminal would consist of two berths, each 1,000 linear feet in length. It would need 100 acres of backup storage and handling area and would have a loop track access. (p. 1-7)



Source: Washington Public Ports Association

FIGURE 7
Study Regions

The Port of Grays Harbor, the only major port in the Washington coast region, is forecast to need eight new berths for logs and lumber by the year 2000. These facilities would require 160 acres of backup yard and 6,000 linear feet of berthing. The Port of Grays Harbor does not appear to have sufficient acreage or shoreline to accommodate this forecast. (p. 1-9)

The major change along the Washington coast has been the decision by the Federal government to discontinue the dredging of Willapa Bay. This has meant a loss of waterborne commerce for the Port of Willapa Harbor, and the logs and forest products that originally were shipped are now being transported by train or truck to Grays Harbor and Longview. (p. 3-12)

This scenario requires a total of eight new berths, costing $98 million, in the Washington coast region by the year 2000. The facilities require 5,950 linear feet of moorage and 160 acres of land. However, this amount of readily developable waterfront property and linear feet of shoreline is not now available. (p. 8-6)

(ii). This report indicates that forecast demand for port space over the next 10-20 years will be greater than the current available space. Since the plan contemplates a much longer time frame than 20 years, it is not unreasonable to assume for planning purposes the need for additional space which the GHEMP envisions prior to there being a "demonstrated need" at the time of plan adoption.

(d). Another recent analysis and evaluation was conducted by the Corps on the need and desirability of widening and deepening the present Federal navigation channel in order to accommodate the export demand of existing wood products in the "Interim Feasibility Report and Final Environmental Impact Statement, Grays Harbor, Chehalis and Hoquiam Rivers, Washington Channel Improvements for Navigation," (Appendix C) September 1982. That evaluation is incorporated into this PEIS by reference because of its relevance to the alternatives analysis for existing and future port/industrial expansion needs. While the Corps projected demands for future exports are more conservative for some products (e.g., logs & wood chips) than the "1980 Ports Systems Study," the evaluation pointed out the following with respect to future growth.

Forestry

Many of the area mills need replacing with modern, more efficient processing facilities, a shift that is expected to accelerate in the future provding adequate sites are available. (p. C-9)

Forest Products Exports

With respect to the substantial increases in log exports to Japan, Korea and China over the last decade, the report concludes: This favorable trend indicates a significant economic development potential that may have long-term implications on the structure of the forest products industry in the region. (p. C-10) Markets in China and other Pacific Rim Countries have enormous growth potential and are just beginning to develop. (p. C-19)

Shipping Activities

This significant growth in harbor tonnage primarily reflects a strong general uptrend in exports loadings of logs and lumber over the last decade. Future growth of waterborne commerce moving through the port will depend on a variety of factors including world demand, improvements to the navigation channel, adequate industrial land, and diversification of the export base. (p. C-12)

Principal Commodities

Although new commodities look to be a definite part of the future in Grays Harbor, the commodity types and volumes, as well as vessels used to transport them, are unknown at this time. Accordingly, no benefits were claimed for induced commodity movements.

The Corps eliminated other existing west coast ports (including Willapa, Olympia, Tacoma, and Longview) and one planned port (Weyerhaeuser's DuPont facility) from further alternatives consideration after determining the excessive overland transportation costs associated with transferring Grays Harbor forest products to these areas (Interim Feasibility Report, p. 17). While alternative port sites are eliminated from further consideration for the purpose of port/industrial expansion related to forest products, the siting of non-forest products industries is another matter. The siting of future energy or industrial facilities may still have to consider alternative port locations during the permit or EIS review period in order to avoid the utilization of wetlands on a case-by-case basis. But what the GHEMP has attempted to do is to recognize not only of the needs for the forest, fishery and tourism interests, but also to allow for diversification, something that is seen as vital to the economic survival of the region.

(e). Industrial Land Requirements.[1]

The economy of Grays Harbor is heavily dependent on the forest products industry. Forest products are followed in importance by tourism and fishing as the basic components of the region's economy.

In terms of land area, forest products handling and processing continue to be the biggest users of industrial land. Waterfront sites are needed in order to have access to the deep water navigation channel through which markets are reached.

During the past several decades a significant change in the typical wood products site has come about. Fifty years ago the Grays Harbor waterfront was dotted with dozens of sawmills and shipping docks. Logs were rafted (floated) from the forests to these sites, to be brought ashore, processed, and loaded aboard relatively small vessels. Land requirements were modest by today's standards, involving only a mill site and a relatively small area to accumulate the next shipment.

1. Stan Lattin, Director of Planning, Port of Grays Harbor (personal communication, 1/24/83).

Today, forest product industries generally receive logs by trucks. The logs are handled and sorted on upland sites, and diverted into one of several product streams, i.e., export milling, peeling, or chipping. These operations have simply outgrown the industrial sites of the 1930's and 40's. Further, because many of these older sites have been surrounded by other land use types, site expansion is all but impossible.

A somewhat similar thing has happened to marine terminals. Economics have forced shippers into larger vessels. The cost of these ships requires quick loading for fast turn-around and maximum utilization. Cargoes 8-10 times the volume of smaller ships must be accumulated near the terminal to facilitate such quick loading. Further, with ship turn-around time measured in days instead of weeks, cargoes must be amassed for a steady succession of vessels.

By way of example, for almost 40 years the Port of Grays Harbor operated four marine terminal berths from an upland base of less than eight acres. Today, the Port operates three marine terminal berths with an upland base of 145 acres (see photo 3 for example of new terminal).

Studies[1] have shown that future production from forests tributary to Grays Harbor will be significantly higher. Greater forest yield coupled with increasing reliance on foreign markets will result in additional demand for large waterfront sites.

While it has long been held that diversification of the economic base of Grays Harbor is necessary ("Overall Economic Development Program for Grays Harbor," 1961), the recession of the past several years has all but made diversification essential. Unlike previous economic downturns, the current recession is resulting in profound changes in the forest product industries. Economic recovery may bring a return to historic production levels, but because of technological and mechanical advances, fewer people are going to be employed.

Diversified industry likely to be attracted to Grays Harbor will most probably be linked to one of the region's assets - its deep draft navigation channel, its location on the Pacific Ocean, its proximity to the United States' Pacific Rim trading partners, or its location relative to Alaska. A common denominator for industries able to capitalize on these assets is the need for a waterfront location.

Various factors combine to shape the relative suitability of an individual site for a particular activity. On Grays Harbor it can be said that sites along the north side of the channel in Aberdeen and Hoquiam have the greatest suitability for water dependent industry. This results from their close proximity to the navigation channel, and in the case of sites downstream from the highway and railroad bridges, unimpeded vessel access and necessary support infrastructure. By way of contrast, sites on the southside of the channel, downstream from the bridges, have severe limitations on cargoes that can be efficiently and economically handled because of the distance to the channel. In general, it appears feasible to handle certain bulk commodities, i.e., coal or grain, on conveyor systems, whereas heavy, large commodities, ie., logs and lumber, would not be practicable.

1. "Forest tributary to the Port of Grays Harbor," Greenacres Consulting Corps., 1977.

Photograph 3.
Port of Grays Harbor Shipping Terminal

One of Grays Harbor's major industrial waterfront sites (at the mouth of the Hoquiam River), has recently been optioned for sale to the U.S. Borax Corp. for a molybdenum processing site. Ore mined in southeast Alaska will be shipped to the site, and supplies needed at the mine will be accumulated at the site and shipped to Alaska. The project will satisfy a long-standing goal of the present site owner, the Port of Grays Harbor, to attract industry which will diversify the economic base.

The only other available publicly owned industrial site is the recently filled 176-acre parcel on the south shore of Grays Harbor. Feasibility studies have been completed to evaluate use of the site for transshipping coal. Because of distance to the channel, (+2000 feet), some type of bulk commodity appears to be the only cargo which can be effectively handled. Also, completion of the Grays Harbor Deeper Draft Project is critical to the economics of utilizing this site.

Consideration has been given to converting public terminal number 2 (72 acres) to a diversified bulk commodity transshipment facility. Because of the high cost (estimated $25 million) and lack of a confirmed need, no action has been taken to date. The terminal continues to be used for shipment of wood products, and supplemental-diversified cargoes are being sought.

Concerning development of additional publically owned industrial sites, mention must be made of the excessively long lead time needed to prepare a site for occupancy. With the use of dredged material for fill, site preparation time is typically measured in years. Seldom are industrial prospects able to make such a long range commitment to "future" sites. Indeed, it seems apparent that preparation of industrial sites in advance of demonstrated need can have a positive effect on economic development and creation of employment.

E. URBAN MANAGEMENT UNIT DESIGNATION ALTERNATIVES

Urban environment designations have the greatest potential for permitting alterations of the estuarine and adjacent upland environment. A review of the Standard Uses Matrix and the forty-three Permitted Activities Matrices show that port and industrial facilities siting, transportation and commercial uses are found primarily in the UD/UM and UR environments. Therefore, alternatives to Urban environment designations are reviewed in this section.

1. UNIT 4: URBAN MIXED

Purpose of Designation: This designation provides an area on North Bay for small boat moorage.

Existing Attributes: This unit is the site of an existing boat basin and, therefore, a modified aquatic environment.

Planned Use Composition: Water- dependent uses are planned in this unit. The use matrix does permit uses generally related to marina complexes, though such uses themselves may not be water dependent. Since no filling of the marina is permitted, these uses would be restricted generally to upland sites. Management objectives of the unit would rule out those conditional uses which would not reinforce the marina or the recreational opportunities afforded by this area. Planning area guidelines further direct conditional use concerns. Consequently, the plan provides for a water-dependent use (marina) in the water areas and for a mixed, but mutually reinforcing, water-related use composition in the upland. This is the only management unit of this character on North Bay.

Alternatives: The combination of uses described above must either be in the water or be of a distinctly different quality. Use of any other aquatic area on North Bay would involve greater disruption of the aquatic environment than this site. Since there is an existing marina located at this site, no further alternatives need be considered. Once the marina has been developed to its maximum and there is additional demand, the Westport boat basin could serve as a potential alternative site to meet future demand for the residents of Ocean Shores as well as the potential waterfront park and marina in MU 17.

2. UNIT 5: URBAN RESIDENTIAL

Purpose: This unit provides a waterfront area for residential use at urban densities.

Existing Attributes: This area is already platted, has developed residential lots, and may be considered committed to residential use (see photo 4).

Planned Use Composition: The plan recognizes the existing commitment "to residential use," but severely limits further waterward intrusion. The plan permits bankline modifications only to the extent necessary to protect existing lots.

Photograph 4.
Bayside view of Ocean Shores looking west.

Alternatives: This site does not have any access from deeper water to support water-dependent uses. Water-related commercial uses would not be desirable in terms of the upland planning concerns of the city. Since future residential use would be limited to developed lots, this area is not suitable for a Conservancy designation. It should be noted that the Urban Residential management category is used only twice in the plan (here and in a very limited area in MU 21-Central Park); thus, the opportunity for waterfront residential uses is very limited.

3. UNIT 6: URBAN MIXED/NATURAL

Purpose: The primary objective of this management unit is to provide a site for a new airport serving the north beach area of the county while protecting the remaining salt marsh.

Existing Attributes: This site is composed of a large transitional salt marsh bounded on the landward side by a line of platted residential lots (see photo 5).

Planned Use: An airport is specifically provided for on the watermost portion of the marsh area and the easternmost residential lots. The remainder of marsh, approximately 190 acres, would then be designated "natural" and development rights to it would be transferred to an appropriate state agency. The remaining lots may be developed for residential purposes.

Alternatives: Alternative issues and considerations are addressed in the Federal Final Environmental Impact Statement[1] on the airport. Additional considerations are addressed in the management unit itself.

Additional Considerations: The entire marsh site has a unique ownership status. When the Ocean Shores project was originally developed, one of the many commitments made by the developer was that an airport adequate to serve the needs of the community would be built on this site. When the city of Ocean Shores was formed in 1970, no airport was constructed by the developer and a class action suit was brought to have such a facility built. A court ordered (Docket #754-489, King County) that the land be made available to the city for the purpose of building an airport. However, the court also ruled that if such an airport were not constructed, the property would revert to the development company (see page 60 of Ocean Shores Airport FEIS). Mitigation was required as a condition of any filling in the wetlands.

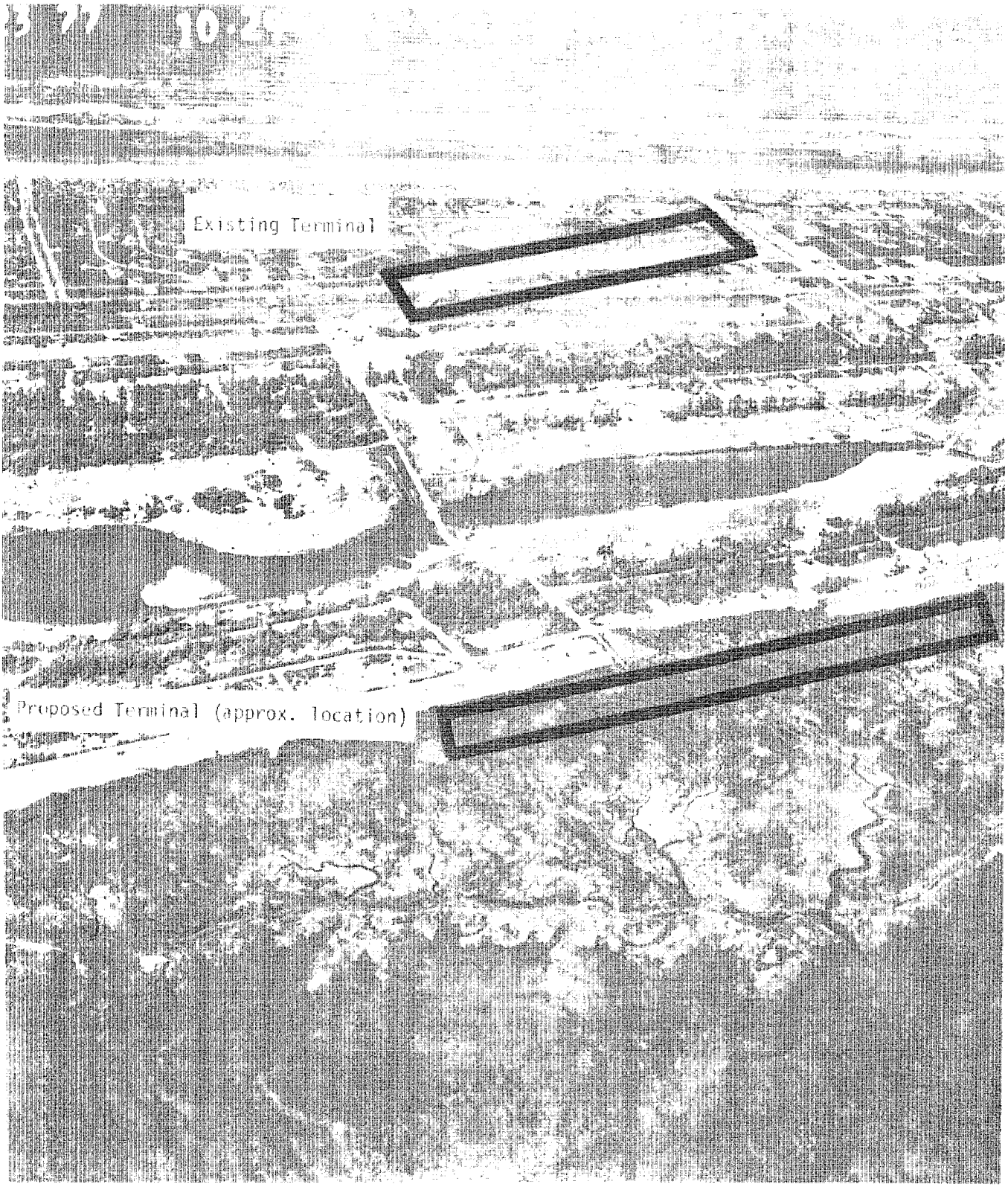
4. UNIT 11: URBAN DEVELOPMENT

Purpose: The purpose of this unit designation is to recognize the existing transportation corridor that uses most of the land in the unit. Because of the intensity of use in the area, urban development was considered the appropriate designation.

1 Federal Aviation Administration, Ocean Shores Aiport FEIS, December 1981.

Photograph 5.

Ocean Shores Existing Air Terminal and Proposed New Terminal Site.



Existing Attributes: The unit is almost completely composed of a railroad and highway corridor.

Planned Use: Continuation of the area's role as a transportation corridor.

Alternatives: Relocation of both the highway and railroad would be practically difficult and highly expensive. Any alternative relocation would be through rugged terrain characterized by sharp, highly unstable slopes. Funds to support highway relocation are not available, and relocation of the rail line would probably not be cost effective. Impacts and alternatives resulting from highway improvements associated with a dangerous curve were evaluated through a Corps of Engineers permit No. 071-0YB-2-005073.

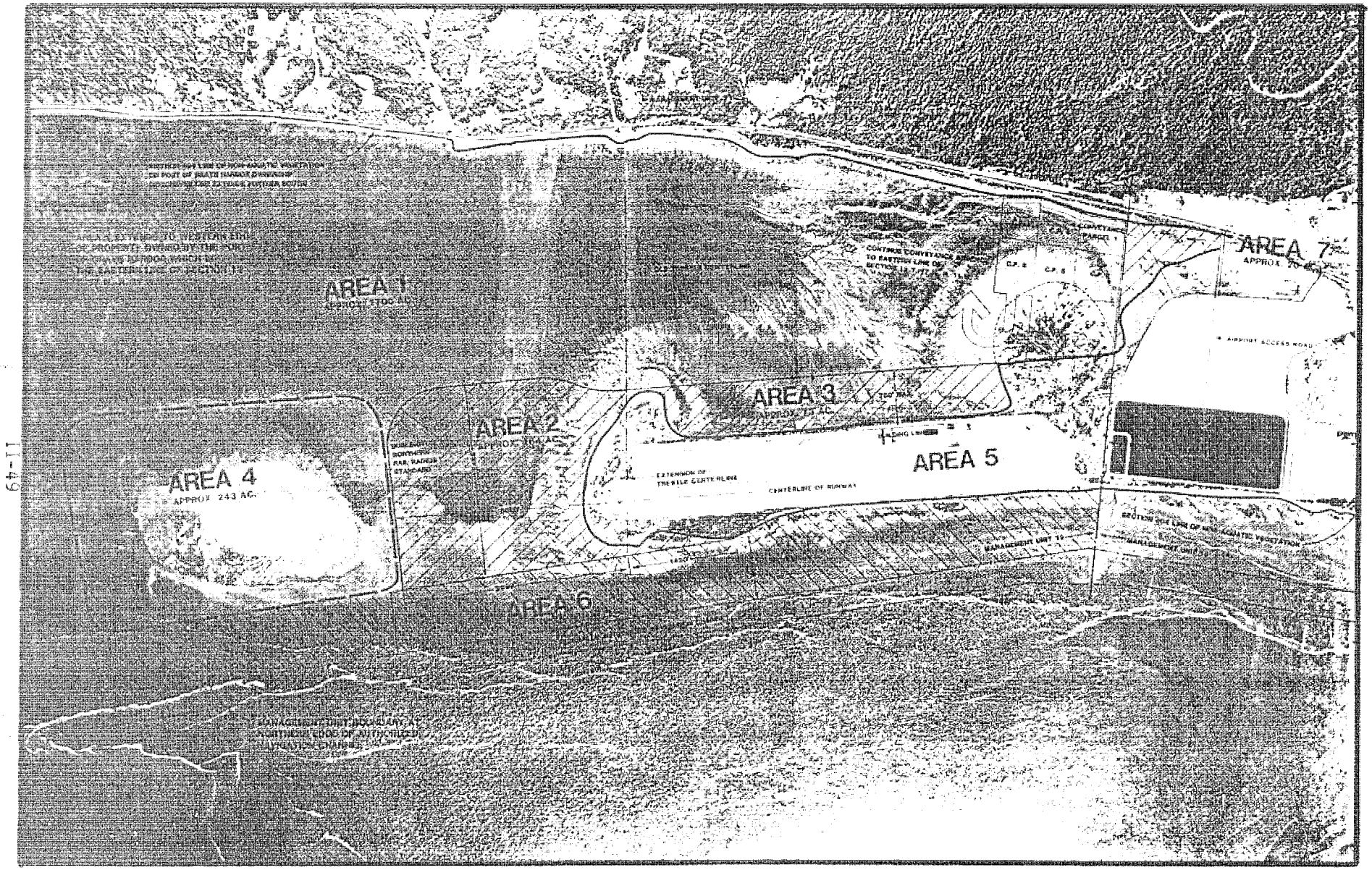
The Standard Use Matrix allows roads and railroad use in Rural Low Intensity and Rural Agriculture MU's as well, so a transportation corridor would not be an inappropriate use. Since the earlier assumption of designating MU 12 (Area 1) for UD use is no longer a valid consideration, this designation could be categorized as RL, thereby being more compatible with the adjacent uses both south and north of the highway/railway. Because of the constraints to any other types of development south of the railroad right-of-way, the impacts associated with the designation of UD or RL are not expected to be significant or different.

5. UNIT 12: (Areas 1, 2, 3, 4, 5 and 6) SPECIAL

Purpose: Unit 12 is intended to provide an area of sufficient size through the phased fill of estuarine habitat to allow greater water dependent industrial expansion over a long-term period along the North Navigation Channel, while providing permanent protection to some of the significant fish and wildlife habitats.

Existing Attributes: The site (excluding the existing Bowerman Air port - Area 5), is approximately 2200 acres in size. The particular characteristics of this general area have been described in Maintenance Dredging and the Environment of Grays Harbor and in appendix C of this document. Because of its characteristics, the area represents a classic conflict between resource use and protection.

Planned Uses: Area 1 - Natural, 1700 acres of intertidal mudflats and fringe marshes will be preserved for the protection of significant shorebird habitat. The transfer of land through fee title represents in part the commitment of the Port of Grays Harbor to the plan. The proposed transfer of land is an attempt to provide a better balance by avoiding unacceptable adverse impacts to the aquatic ecosystem that would result from future fills in MU 12. If the plan is adopted, the Port would request predesignation of the site as unacceptable for disposal or fill even before title has changed hands to the State Department of Game. Future land and water use would be the equivalent of a Natural environment designation and the intertidal area would serve as a fish and wildlife santuary. Habitat enhancement projects may be deemed appropriate in the area (see photographs 6 & 7).



Photograph 6.
Management Unit 12.

Area 2 - Urban Development, 164 acres, would be filled for the purpose of allowing a major multi-commodity, bulk loading and off-loading facility.

Area 3 - Urban Development, 73 acres, would be filled for the relocation of the Bowerman Airport when all or a majority of the existing airfield area is proposed for water dependent industrial use. The fill will be the minimum amount necessary to accommodate an FAA approved Instrument Landing System (ILS) Commuter Airport. The maximum line of fill is limited to 750 feet to the north.

Area 4 - Special, approximately 243 acres, has a designation which denotes that neither the location nor the commitment to fill this area are implied. However, when the need arises, the area depicted on the map (or another area) could be filled for water dependent uses (note: see restrictions in GHEMP, p. 66).

Area 5 - Urban Development, includes the existing Bowerman Airfield. This site is perhaps the most suitable remaining water dependent site for future large scale industrial and port use in the harbor, provided that the necessary piers can be economically and environmentally constructed. However, the site will continue to be utilized as the major airport in the region until such time more demand for the land exists and legal and financial considerations can be resolved.

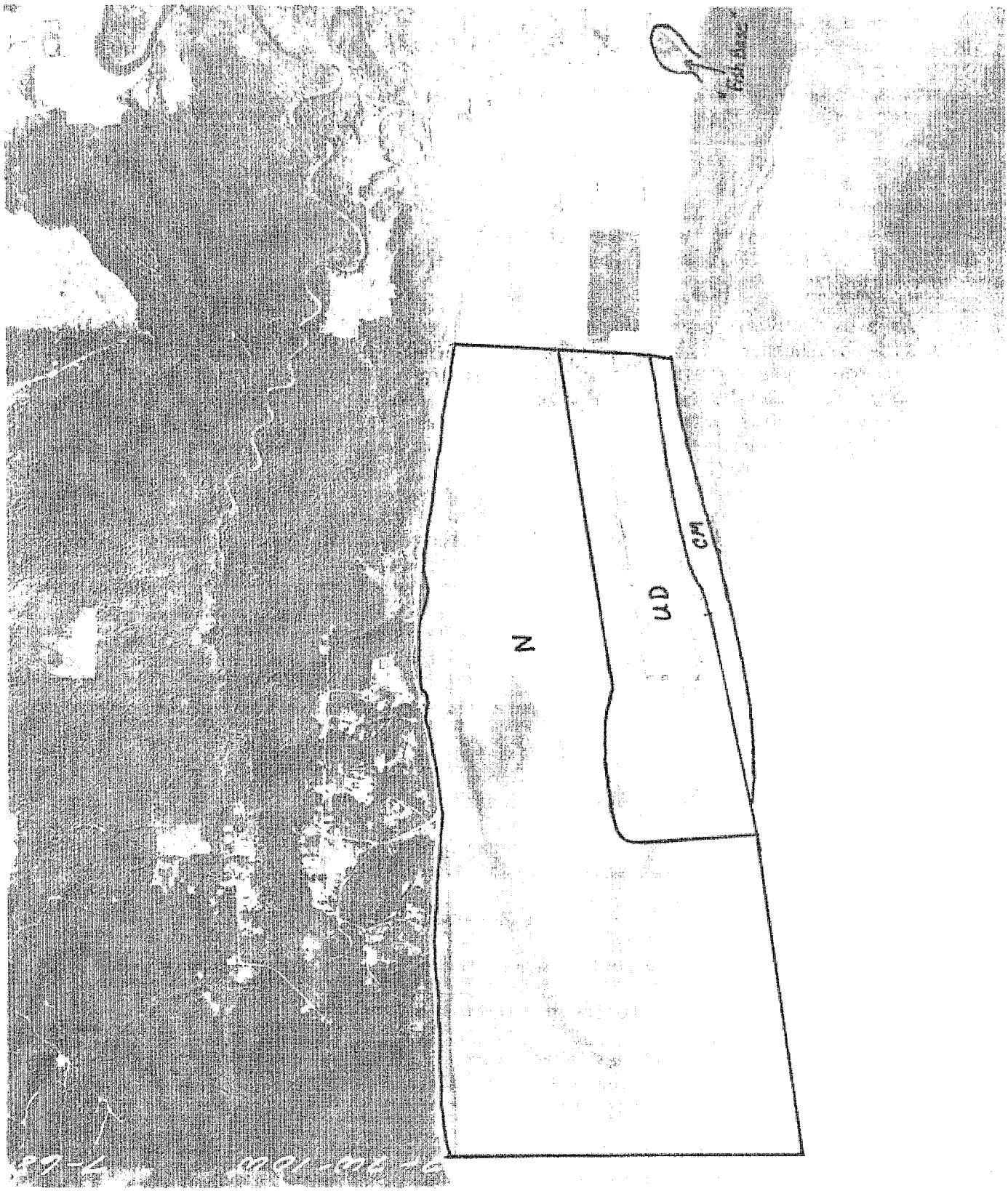
Area 6 - Conservancy Managed, consists of the intertidal mudflats south of the Airfield (and Area 2) to the navigation channel. In all cases, access to the channel for water dependent uses is provided by means of "T" docks, with only limited filling permitted. Taking Areas 2, 4 and 5 into consideration, MU 12 provides a long-term program for future port/industrial development. The ability to reuse and redevelop the Bowerman Field for port and industrial purposes by permitting the airport landing strip to be located north of the existing one and combined with the provisions of the other industrial areas in the plan, should readily meet the potential economic needs of the region for the forseeable future.

Alternative Considerations: This area is owned by the Port of Grays Harbor. Alternatives which have been considered by the Task Force include:

- o designate the entire area as Urban and allow water-dependent, water-related, and other uses which would benefit the local economy.
- o fill all 500 acres north of the Bowerman Airfield; and
- o relocate Bowerman Airport and use the peninsula as an industrial site.
- o fill tidelands south to the navigation channel.

All four major alternatives have been rejected by the Task Force members as either being environmentally, legally or economically unacceptable. The following factors were considered.

a. Designate entire area as Urban. Filling 2200 acres of aquatic area during a short-term or long-term period was rejected based on unacceptable adverse environmental impacts and failure to comply with current Federal and State statutes.



Photograph 7. Management Unit 12 absent Area 4 designation.

b. Fill 500 acres north of the Airfield. The November 1978 preliminary draft version of the GHEMP which was circulated to the public proposed a phased fill of the area north of the Airfield (see figure 8). Again, based upon comments received from the public and review of the proposal for consistency with the 404(b)(1) Guidelines and Section 7 (Endangered Species) consultation, this alternative was found environmentally unacceptable.

c. Relocate Bowerman Airport and use the peninsula for port and industrial expansion. Alternative sites for relocating the Bowerman Airport were considered in Bowerman Field Relocation Planning Study, 1979 by prepared by the firm of CH_2M Hill. The conclusion of that study was that "there is no opportunity to locate a new Basic Transport airport in the 1,200-square-mile study area that would readily serve the population base and be environmentally and economically prudent to develop." (p. 97). Three sites outside of the estuary were identified which might serve as a General Utility category airport. However the existing use of the site as an airport and legal commitments made by the Port prevent for 20 years its use for purposes other than as an airport. Since Bowerman Field is the regional airport facility, its relocation would also require significant capital investment. By placing a new runway north of the existing runway, costs would be kept to minimum since a new tower and other fixed structures would not have to be built and the airport remains in a position which best serves the region and has the greatest aviational safety features. Relocation of the Airfield was rejected for legal and economic reasons at the time. However, the filling of Area 3 is contingent upon several integral actions:

(1). That it be done only to accommodate the relocation of the Bowerman Airfield.

(2). That it can only take place if all or a majority of the existing Airfield is proposed for water-dependent industrial use.

(3). If Area 2 is filled prior to a permit application in Area 3, an evaluation of filling Area 2 will be conducted as part of the permit review process in order to determine whether environmental conditions have changed sufficiently as a result of Area 2 fill to demonstrate that other alternative airport sites would be less damaging. This condition resulted over the concern for the shorebird/raptor population. As a consequence the possibility of not filling the area for airport relocation is not precluded.

d. Filling the tidelands south of the peninsula was considered but rejected as having unacceptable adverse impacts on fishery resources.

Alternative Sites: As was previously stated in the alternatives discussion, alternative sites for port and related industrial expansion were considered. Part of the criteria which were used include the availability of infrastructure including rail, road and air service, industrial water supply and sanitary services, and power supply. Additional site specific services including fire and police protection, business services and industrial suppliers were also important. Given these factors and the importance of protecting the fish passage, Task Force members feel that port expansion for water dependent uses (including use for some wetlands fill for the airport runway) in this area is justifiable and, with the inclusion of mitigation and enhancement projects and monitoring of impacts, that the current designation of MU 12 as identified in the plan would not be considered an unacceptable adverse environmental impact. For a discussion of impacts, see appendix C.

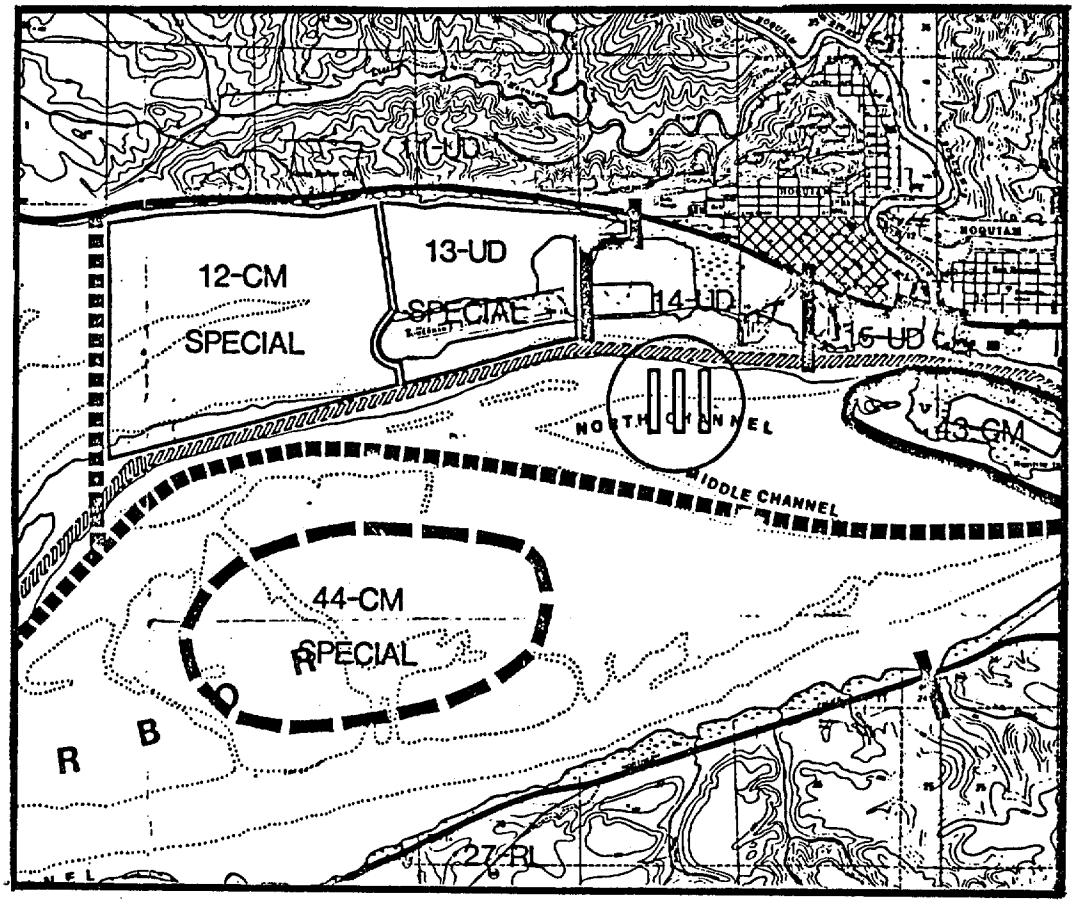


FIGURE 8

Previous management alternative to Management Unit 12 (then MU's 12 & 13). April 1978 Draft GHEMP.

6. UNIT 14: URBAN DEVELOPMENT

Purpose: The purpose of this management designation in MU 14 is to recognize the strategic location of this unit between the navigation channel and the prime regional industrial area. However, the uses and activity which would modify the aquatic area in and adjacent to this unit are limited in order to conserve the area's significant biological resources.

Existing Attributes: The upland portion of this management unit is a developing industrial area of regional significance and it would serve as a link to the planned industrial area in MU 12. The bankline within this unit is also considered important for fish migration and feeding.

Planned Uses: The upland portion of this unit would be designated Urban Development with encouragement for location of water oriented industry (as provided in the special conditions in MU 12). While a diverse range of uses is allowed in the unit's use matrix, the area's value as an industrial location and its existing use commitments will direct the unit toward regional industrial development. Any use of the aquatic area is limited by the Activities Matrix and the special conditions for water dependent structures (with very limited fill for approach) which would provide access to the navigation channel. Also, the special conditions severely limit such activities from destroying migration routes or critical feeding areas.

Alternative Considerations: The existing developed character of the upland area of this unit makes its designation as another management category unrealistic. Also, for reasons similar to those discussed in MU 12, this general area is one of the most appropriate areas for industrial uses (MU 14, however, cannot fulfill the role envisioned for Unit 12 as a future industrial park due to MU 14's existing uses). The proximity of MU 14 to the navigation channel and to other developed and planned industrial areas makes it an optimum location for the proposed piers. No other site can serve the general industrial area of Hoquiam as well.

An alternative designation to UD would be to make this a split MU with a Conservancy Managed designation to protect the important fishery habitat area. Because the boundary was changed to include the fish base within MU 44, this alternative is no longer necessary.

7. UNIT 15: URBAN DEVELOPMENT

Purpose: The purpose of this designation is to recognize the existing development commitment in this area.

Existing Attributes: This unit presently has the major concentration of heavy industrial related activities in the region. Activities include the major marine terminals, a pulp and paper mill, a modern computerized saw mill, and gravel load and unloading facilities.

Planned Uses: The site will be used for heavy industrial purposes with emphasis on water-dependent and related uses. As noted, it is unlikely that non-water related uses would be established in the area due to its present use character and other legal commitments. The other likely possibility would be the development of a water-related processing plant by the private terminal owner of the upland portion of this property. The Port owned Kaiser site is currently not being utilized but is considered by the U.S. Borax Corp. for possible option to purchase the site. Filling and/or development of the existing Port slips would be allowed.

Alternative Considerations: The existing character of this unit makes an alternative designation impractical. Alteration of the aquatic area would be restricted to either a water-dependent use or a purpose which is directly related to the present water-dependent uses (see photo 8).

8. UNIT 16: URBAN MIXED

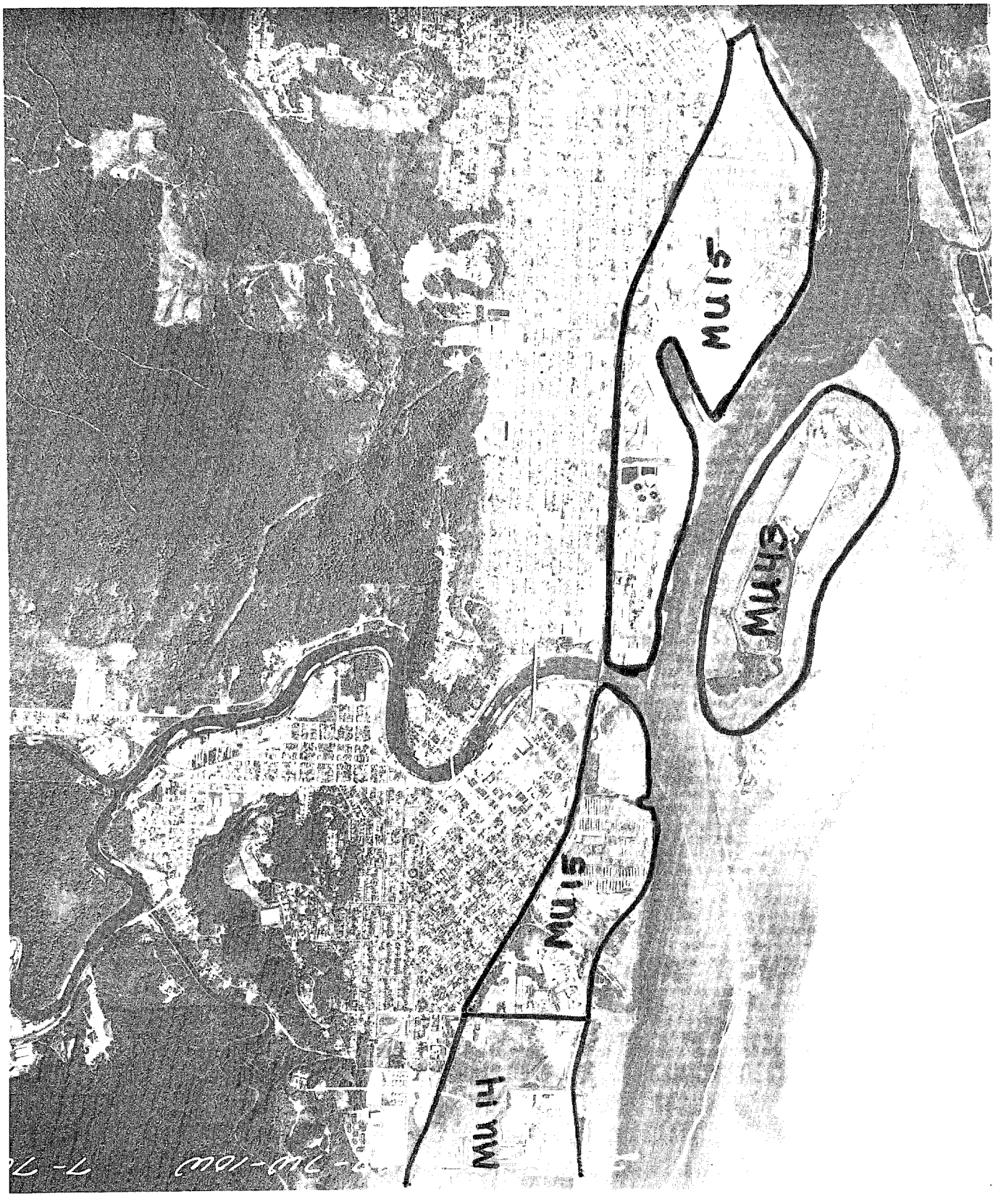
Purpose: The purpose of this unit designation is to recognize its proximity to the Aberdeen Central Business District and the Chehalis River, two major sources of commercial and industrial activity. Within this unit a unique mix of commercial and industrial uses is encouraged to continue and develop in the future. Public access to the waterfront is to be designed into new and rehabilitated projects when practicable.

Existing Attributes: This unit and adjacent areas are in the process of reorientation from a predominantly industrial area to a finer intermix of commercial and industrial uses, an intermix which was originally established in early Aberdeen. Some sites within the unit are badly deteriorated and are in need of rehabilitation or redevelopment.

Planned Uses: This unit is designated UM to permit continuation of existing development and encourage future reinvestment in commercial and industrial ventures. Water area modifications are permitted for two reasons--to allow water dependent uses or to encourage the rehabilitation and the development of uses which would promote the revitalization of this area; uses that would, where appropriate, help provide increased public access to the waterfront.

Alternative Considerations: The existing and developing character of this MU makes an alternative designation impractical. The sites within this area are too small for most water-dependent uses. The rail facilities bordering the area limit the potential to expand the sites. These rail facilities also severely constrain the portion of this area between the railyard and the Chehalis River.

In all cases, the waterward extent of any modification is limited in order to protect the fish migration route (the fish passage).



Photograph 8. Management Units 14, 15 and 43.

9. UNIT 17: URBAN MIXED

Purpose: This unit designation recognizes the unique potential of this area to provide greater public access to the water area and to permit the continued redevelopment of a previously heavily used industrial area of the shoreline.

Existing Attributes: This unit is in the process of transition. Historically, it was a heavy industrial area. As site requirements became greater for industry, the small mills located here were abandoned, creating an unused and visually unattractive area which has persisted for many years. Due to many factors, including site limitations, the redevelopment of this area for industry has become impracticable. However, the area's strategic location in relation to the regional traffic flows has already made it a prime site for commercial development. As a commercial area, the unit also offers greatly improved public access to the waterfront.

Planned Uses: The continued development and rehabilitation of the unit from an obsolete and debilitated industrial area into a commercial and public access area is envisioned by the plan. Water area modifications which may be conducted here are directed toward several purposes:

- Protecting shore uses,
- Providing opportunity to rehabilitate the waterfront,
- Increasing public access and opportunity to enjoy the waterfront (see figure 9, a proposed site plan for the Aberdeen Riverfront Marina Park),
- Allowing limited development of any water dependent use which might be permitted.

Alternative Considerations: This unit's strategic location in relation to regional traffic flows makes it the optimum commercial area in the region. As such, it has an opportunity to meet growing regional commercial needs. This potential, coupled with both the site's poor suitability for major new industrial or large water-dependent activity and its former blighted condition, has made its commercially oriented designation appropriate. Given the industrial use and designation of most of the urban waterfront, this unit offers one of the very few opportunities for the development of public access to the urban waterfront environment. This capability also gives the unit a potential for development in tourism related activities, an important sector of the local economy. Possible alternatives include Urban Development designation and encourage more intensive use of the area for industrial purposes.

MAP 15

Proposed Site Plan Morrison Waterfront Park

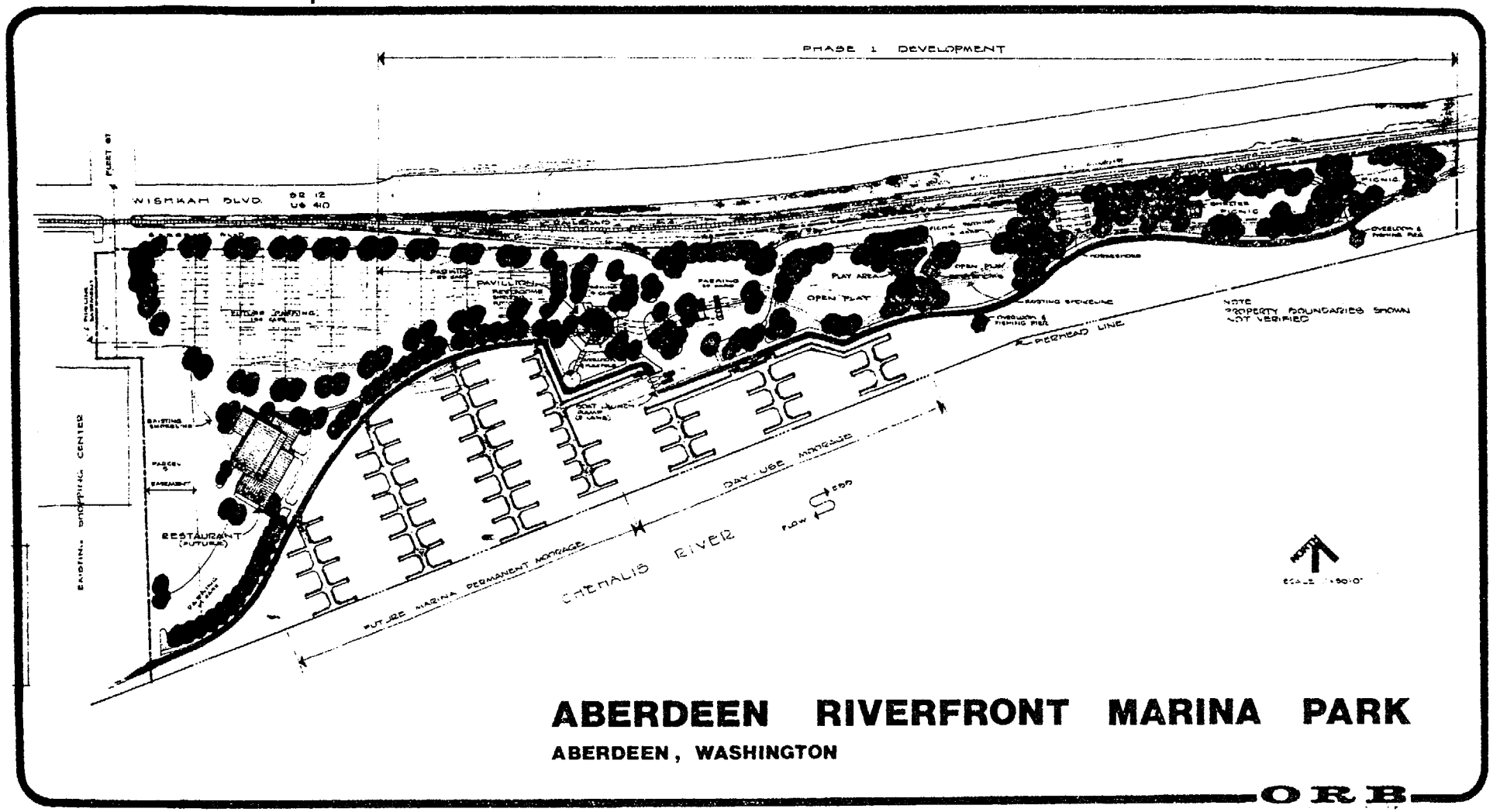


FIGURE 9.

10. UNIT 18: URBAN DEVELOPMENT/NATURAL

Purpose: The purpose of this unit's designation is to provide the opportunity for heavy industrial use, while protecting significant biological resources of the area.

Existing Attributes: The unit is an old, blighted industrial/residential area infused into an area of mixed freshwater and upland environments. The unit also encompasses portions of Elliot Slough. Riparian vegetation along the slough is important for habitat and flood retention. The unit is adjacent to the main body of the Chehalis River and therefore offers access to the navigation channel. Ownership in the unit is predominantly private.

Planned Uses: Uses planned for the area are intended to balance the provision of opportunity for industrial development with preservation of Elliot Slough, particularly important freshwater marsh areas, and aquatic vegetation. Consequently, this proposal for use involves the complex division of the unit into "Urban Development" and "Natural" subdesignations (see photo 9). These designations were made upon the basis of detailed biological analysis and specific negotiations with the property owners.

Alternative Considerations: Modification of the saltwater aquatic area consists primarily of water-dependent activities (boat houses or access to navigation channel); facilities to protect upland uses; and a very limited amount of bankline straightening (where essential to maintain the function of the proposed upland use), or facilities intrinsically related to the area (outfalls or cable and pipeline crossing). Consequently, these attributes cannot practically be located away from the shoreline and still serve a viable function. Designation of the upland portion of the unit as an urban development area is based in part on its existing character and ownership.

Unit 18's access to the navigation channel offers the potential for expansion of water dependent/related industrial development. Much of the area is considered as potential upland sites for the disposal of dredged material. While no alternative appears to be practical, designating some of the yet undeveloped parcels of land as Conservancy or Natural is possible.

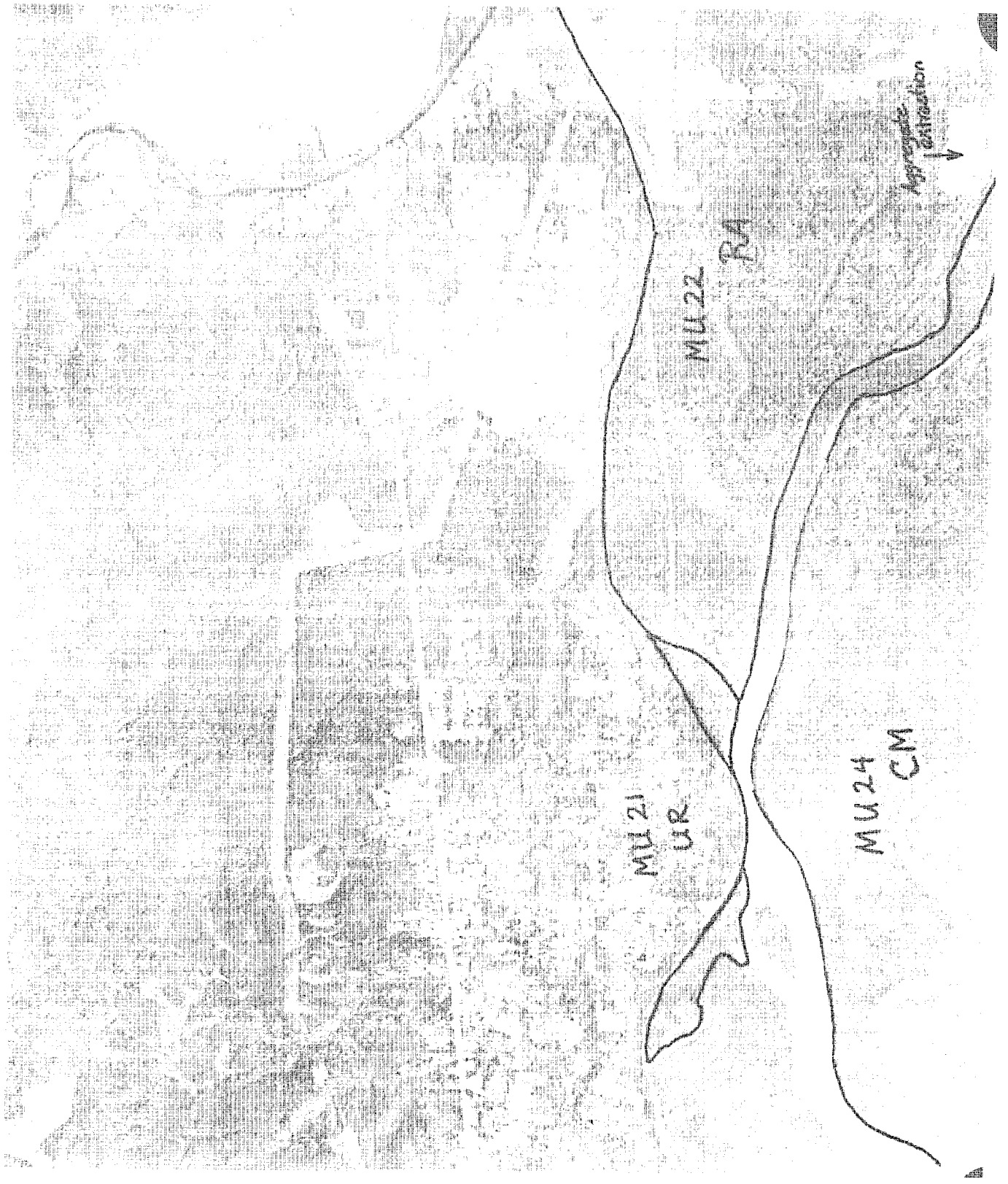
11. UNIT 21: URBAN RESIDENTIAL

Purpose: This designation recognizes the existing use and quality of the unit.

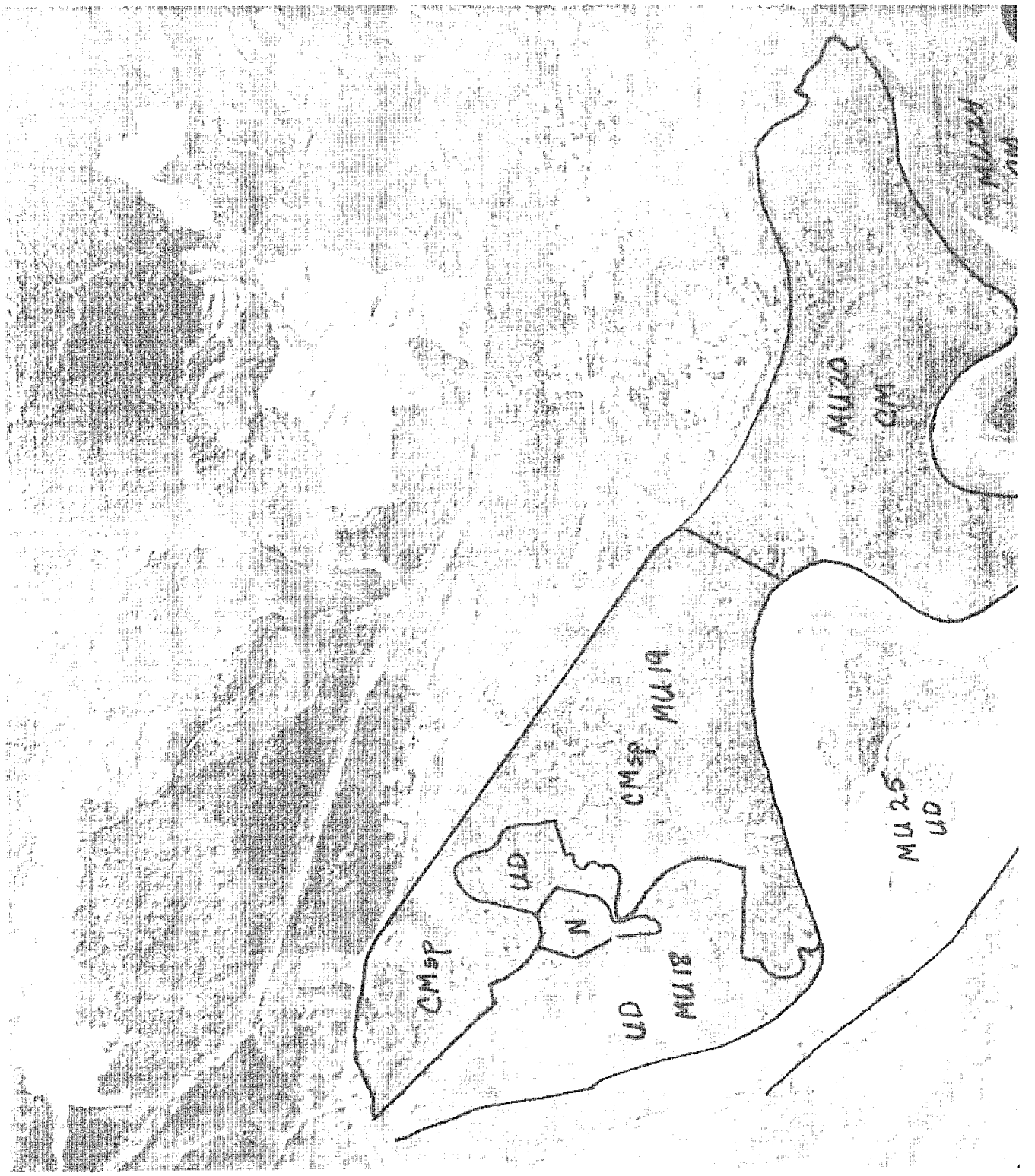
Existing Attributes: The unit is a small area of residential development on the upland edge of the expanse of fresh water swamp found in this planning area. The unit was separated from the adjacent "Conservancy" and "Rural" units because of its distinctly different character (see photo 10).

Planned Uses: Residential with opportunity for development of compatible uses. Aggregate extraction is a permitted use.

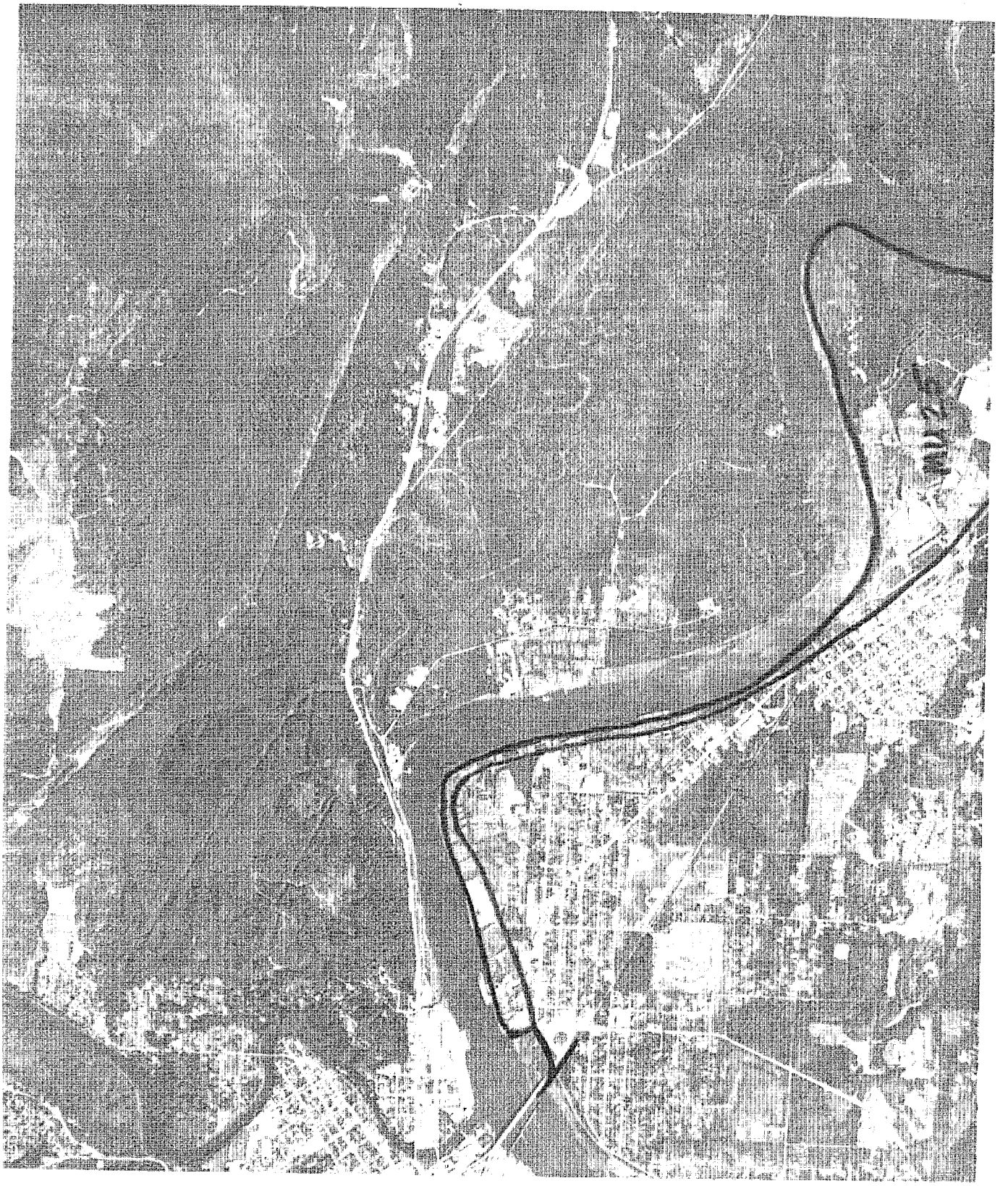
Alternative Considerations: Since it is impractical to relocate existing uses, and because such relocation would result in little enhancement of the resource, no alternative site option seems realistic.



Photograph 10. Management Unit 21.



Photograph 9. Management Units 18, 19 & 20.



Photograph 11. Management Unit 25.

12. UNIT 25: URBAN DEVELOPMENT

Purpose: The purpose of this designation is to recognize the established role of this unit and its need for redevelopment of blighted areas. As such, its existence also establishes a transition between its urban uses and the Conservancy units upstream.

Existing Character: Similar to Unit 16, this unit has a diverse make-up of urban uses, ranging from a large pulp mill to boat ramps and a small park. It has been the site of several lumber mills which have passed or are approaching the end of their usable lives. Consequently, there are several areas of existing or potential blight in this unit. The unit also encompases the proposed industrial expansion location needed by one of the region's major employers.

Planned Uses: This designation envisions a continued and gradual redevelopment of the unit's Urban Development character. It also provides some room for growth for the existing pulp mill.

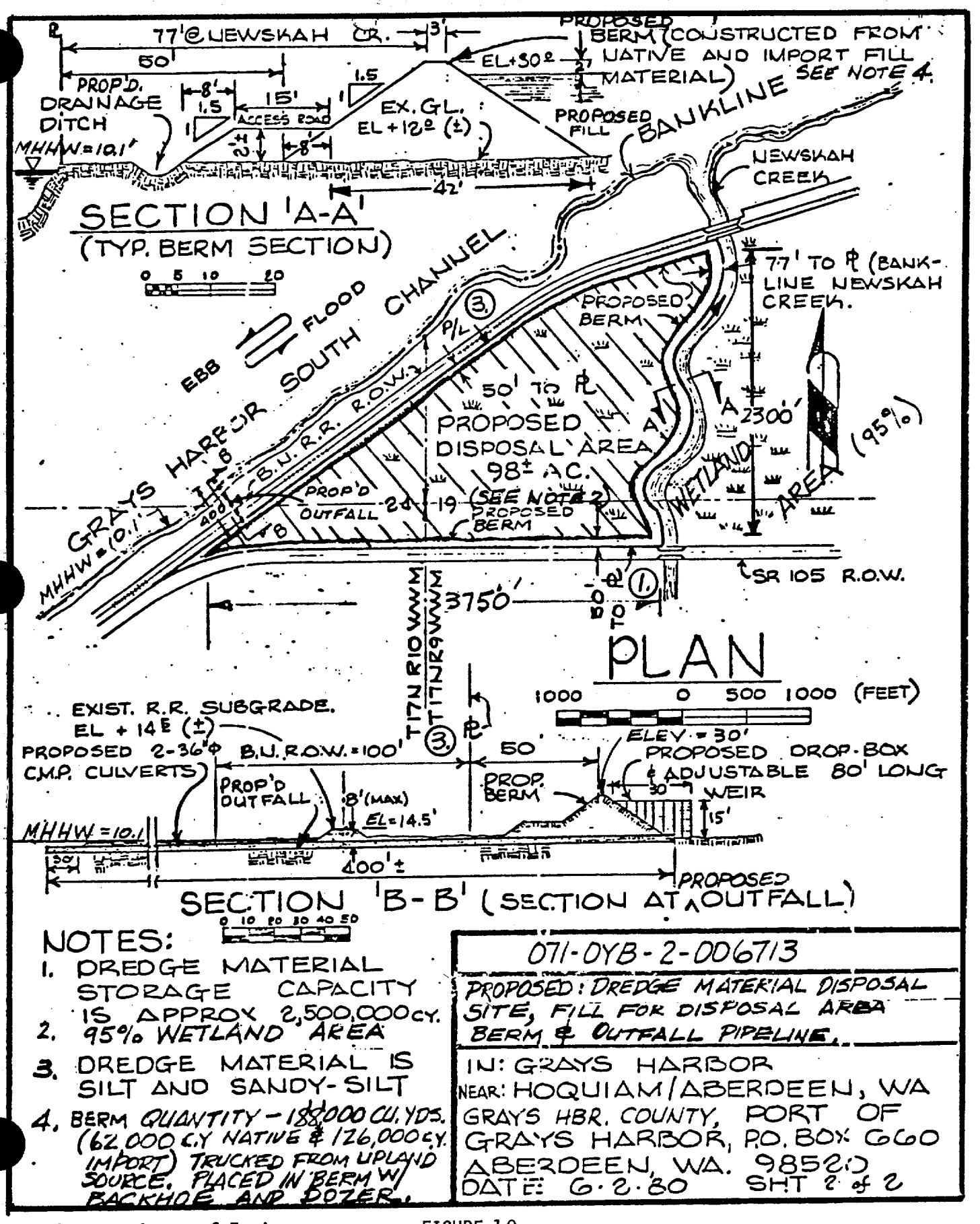
Alternative Considerations: Since the management decisions for this unit are related to existing uses or the presence of blighted areas, the purposes served by the unit cannot be provided elsewhere. The pulp mill operation cannot be feasibly expanded except into the area provided for by the plan (see photo 11).

13. UNIT 26: URBAN DEVELOPMENT/CONSERVANCY MANAGED

Purpose: The purposes of this split unit are to protect the critical role that its aquatic vegetation serves for fish migration and feeding, and to recognize its role for potential industrial uses.

Existing Attributes: The existing area has a complex mix of uses and roles. On the water side of the railroad line is an expanse of marshland (designated as CM) of significant biological importance, particularly for supporting fish migration. Within this area is an old saw mill originally established at its site for access to log rafting. The waste treatment lagoons for the Weyerhauser Pulp Mill are also found here. On the land side of this unit (designated as UD) are established residential uses in the north portion, and diked old farming areas (including a junk yard) with a fringe of marsh along the creeks. Some freshwater marsh areas are also associated with the diked areas, which were once used for farming, but now have become marshland due to lack of active use. The Port has also been using one of these former pastures for contained maintenance dredge material disposal and has requested a permit from the Corps of Engineers to allow additional disposal in 98 acres for purposes of maintenance dredge disposal. The Corps is currently reviewing that request through the standard permit process procedures (see figure 10) and is in the process of preparing an environmental impact statement.

Planned Uses: All new development north of the railroad (except for reasonable maintenance of the existing mill) must be water dependent, and would be limited in order to protect the resource role of the aquatic vegetation. Development would be permitted landward of the rail line. It is envisioned that after the site is filled, these areas will become industrial sites.



NOTES:

1. DREDGE MATERIAL STORAGE CAPACITY IS APPROX 2,500,000 CY.
2. 95% WETLAND AREA
3. DREDGE MATERIAL IS SILT AND SANDY-SILT
4. BERM QUANTITY – 188,000 CU. YDS. (62,000 C.Y NATIVE & 126,000 C.Y. IMPORT) TRUCKED FROM UPLAND SOURCE. PLACED IN BERM W/ BACKHOE AND DOZER.

071-OYB-2-006713

PROPOSED: DREDGE MATERIAL DISPOSAL SITE, FILL FOR DISPOSAL AREA BERM & OUTFALL PIPELINE.

IN: GRAYS HARBOR
NEAR: HOQUIAM/ABERDEEN, WA
GRAYS HBR. COUNTY, PORT OF GRAYS HARBOR, P.O. BOX 660 ABERDEEN, WA. 98520
DATE: 6·2·80 SHT 2 of 2

Source: Corps of Engineers

FIGURE 10

This unit is one of the few that poses relatively minor development problems: it can be protected from floods, is within range of urban services, has good highway and rail access, has relatively minor land use conflicts, and is more suitable than any other area which lacks good water access. This is the only other area in Grays Harbor which allows for major, long-term industrial expansion where the land is not already committed to industrial uses. The major loss would be to approximately 98 acres of fresh water marshes south of the railroad line (see photo 12). The plan ensures that the riparian vegetation along Charley and Newskah Creeks will be protected in a 50 foot-wide, no-development buffer strip.

Alternative Considerations: This unit has significant resource values due to its aquatic vegetation and anadromous fish creeks (Newskah and Charley). The shoreline is currently classified as Urban under the existing SMP so the proposed classification would reduce existing allowable uses. The Task Force did not ignore the potential access to the channel, which would be provided by means of a trestle. Consequently, the plan leaves the potential for water dependent use possible under appropriate control to guard the salt water marshes and creek habitats.

Alternatives would be to classify the area as RA/RL or CM throughout, thereby precluding any future industrial development. Alternatively, the salt water marsh area north of the railroad is currently zoned industrial and could serve for future industrial expansion if designated UD.

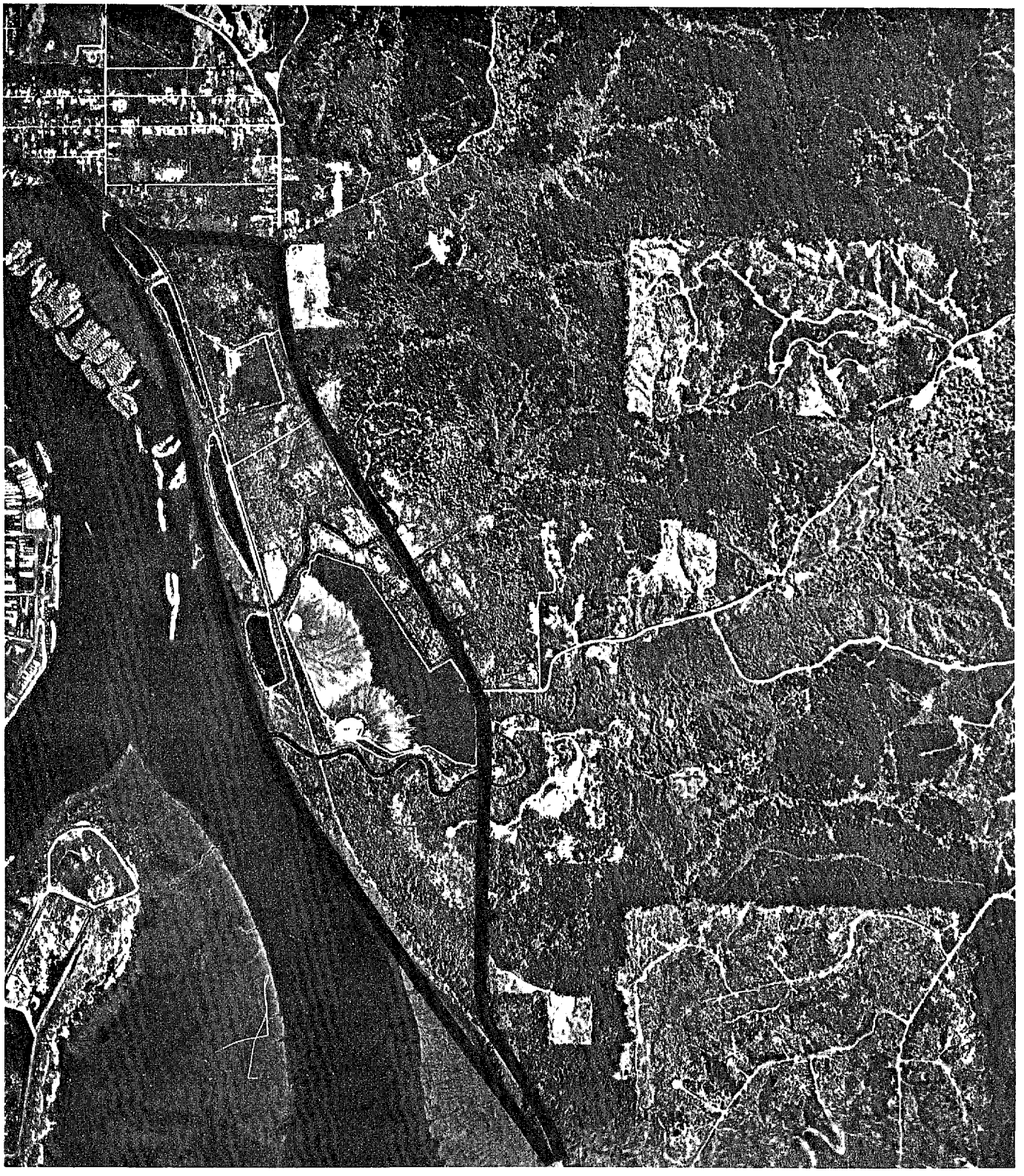
14. UNIT 28: URBAN DEVELOPMENT/CONSERVANCY MANAGED

Purpose: The purpose of this designation is to recognize past and present use of this unit for food processing activities and other urban uses which might be related to these activities, while conserving adjacent aquatic resources.

Existing Attributes: This area has a large cranberry processing plant and assorted oyster harvesting activities. Located at the mouth of the Johns River, the unit constitutes the only significant cluster of urban uses and one of the few opportunities for small craft navigation facilities on the entire south shore of the estuary between Aberdeen and Westport.

Planned Uses: The planned uses of this unit consist of continuation of the existing cranberry and oyster activities along with construction of limited docks and other navigation facilities to support water dependent activity. Most of the wetland character of the area's aquatic vegetation would be protected.

Alternative Considerations: Since the planned development activities are related to the existing character of this site, any alternative area could not serve the same purpose and have fewer impacts. All aquatic activities are limited to water dependency. The opportunity for industrial activities would be limited to this one site for the entire South Bay.



Photograph 12. Management Unit 26

15. UNIT 33: URBAN MIXED/CONSERVANCY MANAGED

Purpose: The designation recognizes the existence of a transportation corridor crossing the Elk River Estuary at the eastern end of the bridge crossing the Elk River (see photo 13).

Existing Character: The unit is a small area consisting of the end of a highway bridge and an assortment of residential and other urban uses concentrated in Bay City.

Planned Uses: Planning for the unit envisions continuation and limited expansion of existing uses and activities. Aquatic modifications are limited to small docks associated with upland residences and those activities associated with the bridge and utility crossing.

Alternative Considerations: Since the character of the existing area and any potential growth is related to the bridge crossing, and since this bridge is the only feasible crossing point, no other management designation alternative for this unit is possible.

16. UNIT 35: URBAN MIXED/CONSERVANCY MANAGED

Purpose: The purpose of this unit is to recognize the area including the western end of the bridge crossing the Elk River Estuary.

Existing Attributes: The character of this unit is similar to but less developed than Unit 33.

Planned Uses: Same as Unit 33.

Alternative Considerations: Same as Unit 33.

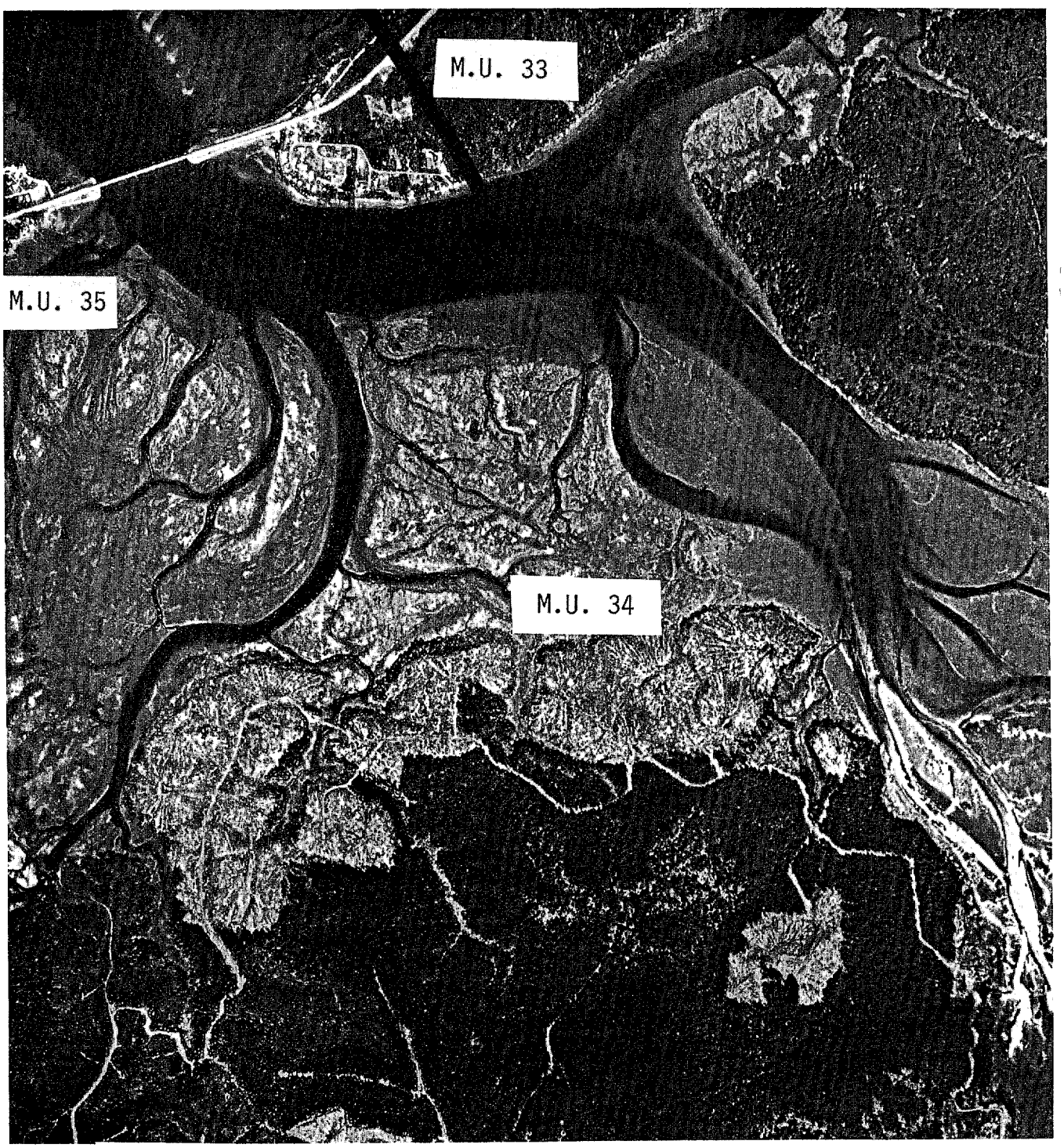
17. UNIT 37: URBAN MIXED/CONSERVANCY MANAGED

Purpose: This management unit establishes an eastern line of limitation for the encroachment of urban uses into the shoreline environment.

Existing Character: The unit is composed of mixed urban use (primarily residential) on its uplands and includes an expanse or transitional marsh. The marsh is used for grazing.

Planned Uses: Continued development of the uplands for urban uses as may be appropriate for the needs of the City of Westport, and conservation of the area below the 404 line for its natural resource values. There is considerable marsh in the eastern portion which will be preserved in its natural state.

Alternative Considerations: The proximity of this unit to the highway provides suitable access for residential development. While such urban uses might be relocated to alternative sites, the incorporated nature of this area and the presence of urban services make it suitable for such use without significantly injuring resource values.



Photograph 13. Management Units 33, 34 & 35.

18. UNIT 38: URBAN MIXED/CONSERVANCY NATURAL

Purpose: This designation recognizes the existing dual role of this unit both in providing Westport's airport and in serving as a marsh area.

Existing Attributes: The unit has two uses, as an airport and as a marsh area.

Planned Use: The plan permits, but strictly limits, some development and improvements to the existing airport (runway). It protects the remaining marsh area (except for allowing some possibility for expansion of the Westport Marina). The retention and eventual upgrading of the airport is important to both Westport's role as the major sport fishing port in the region and to efforts to diversify the local and regional economies by expanding the use of other recreational opportunities in the Westport area.

Alternative Considerations: The present site has been used as an airport for many years and these activities have modified the character of the site (see photo 14). Therefore, the no action alternative would not prevent the present use of the high marsh wetlands for the grassy airport runway.

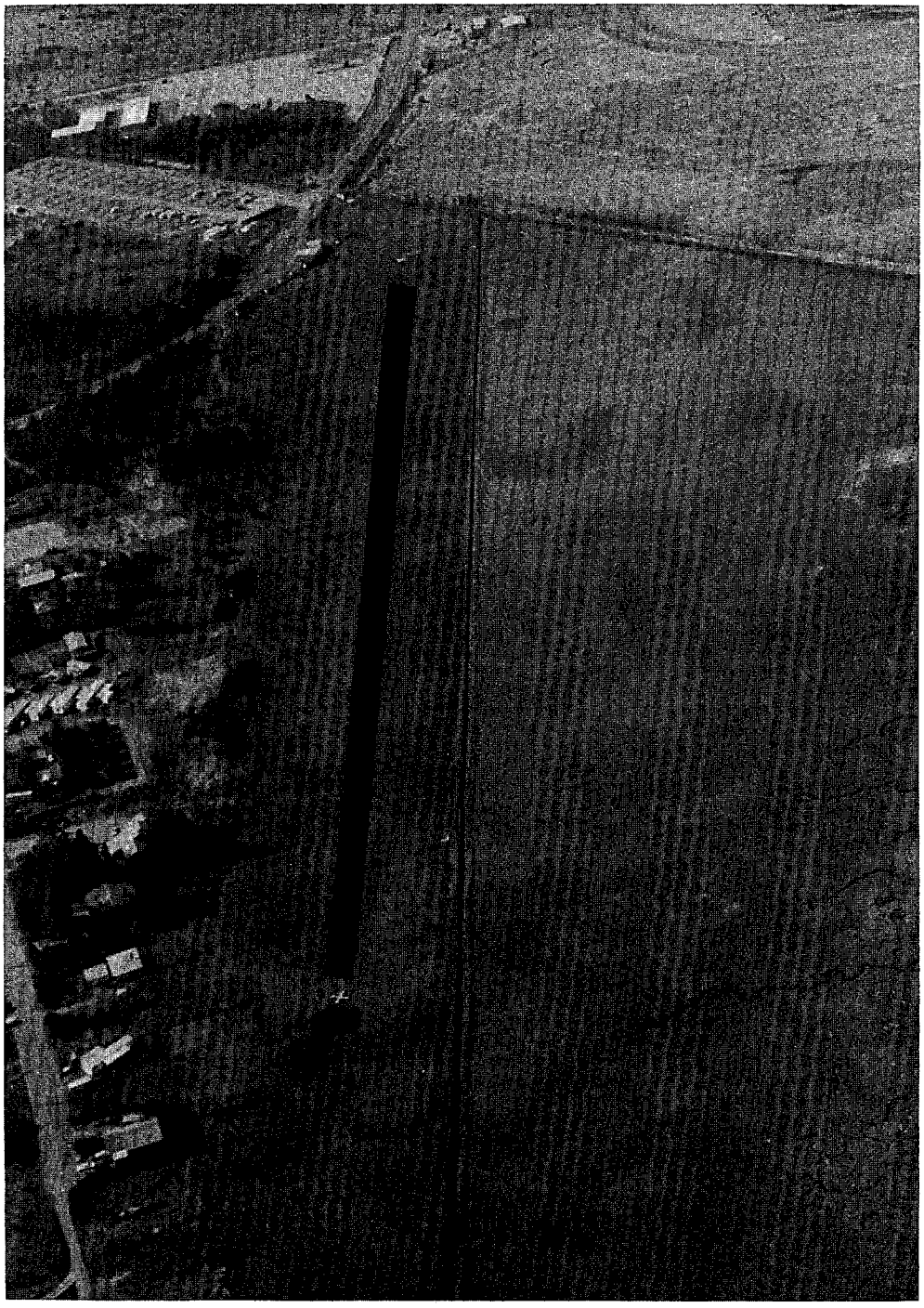
Because of the topography and existing land use patterns of the Westport area, few sites if any are well suited for airport development. Because of the longterm use of this site and location of uses which would conflict with an airport at other sites, continuation of the airport in this location is the most viable alternative. The airport improvements which would be possible under the plan would only be the minimum necessary for a standard small aircraft landing facility. The plan contains specific provisions limiting the extent of the fill that may be permitted to minimize the potential adverse impacts which might result (GHEMP, p. 99).

19. UNIT 39: URBAN MIXED

Purpose: This unit provides for the future expansion of the region's major marina. As such, it significantly benefits the economic base of the region and provides access to water recreation for thousands of people annually. It is one of the most important water recreation facilities of the entire State.

Existing Attributes: Most of the unit consists of the Westport Marina and related activities. It does include a significant marsh area to the south and large undeveloped areas west and upland from the marina.

Planned Uses: The area is expected to allow future expansion of the marina with related upland uses and services. A major role of the facility would be to continue to provide and develop public access to the shore and the recreational opportunities of sport fishing as well as providing additional development opportunity in the commercial seafood industry. The Port would contemplate expansion only when sufficient demand for additional port slips justifies the economic costs related to the expansion.



Photograph 14. Management Unit 38 - Westport Airport

Alternative Considerations: A marina is a water dependent use. Consequently, no alternative site would be feasible unless such site also was an aquatic area with suitable navigation access. Other limits under present Corps programs restrict alternatives to the present basin or along the main navigation channel (the access to the Ocean Shore Marina is not Federally maintained). Winter storms and heavy seas make this area unsuitable for large vessels. Use of another area would require channel development with related adverse environmental impacts. Combining future marina development with the existing facility allows greater economies of scale and reduces the potential of increasing adverse environmental problems. Such a combination also permits provision of the necessary public services (especially those needed for water quality) in an efficient and effective manner.

One expansion of the existing marina has already been completed within the existing basin (see figure 11). The plan would contemplate a second marina expansion into the wetlands (approx. 48 acres of submerged, intertidal and marsh wetlands to be dredged and/or filled) south of the existing marina for additional commercial and recreational boating sometime in the future.

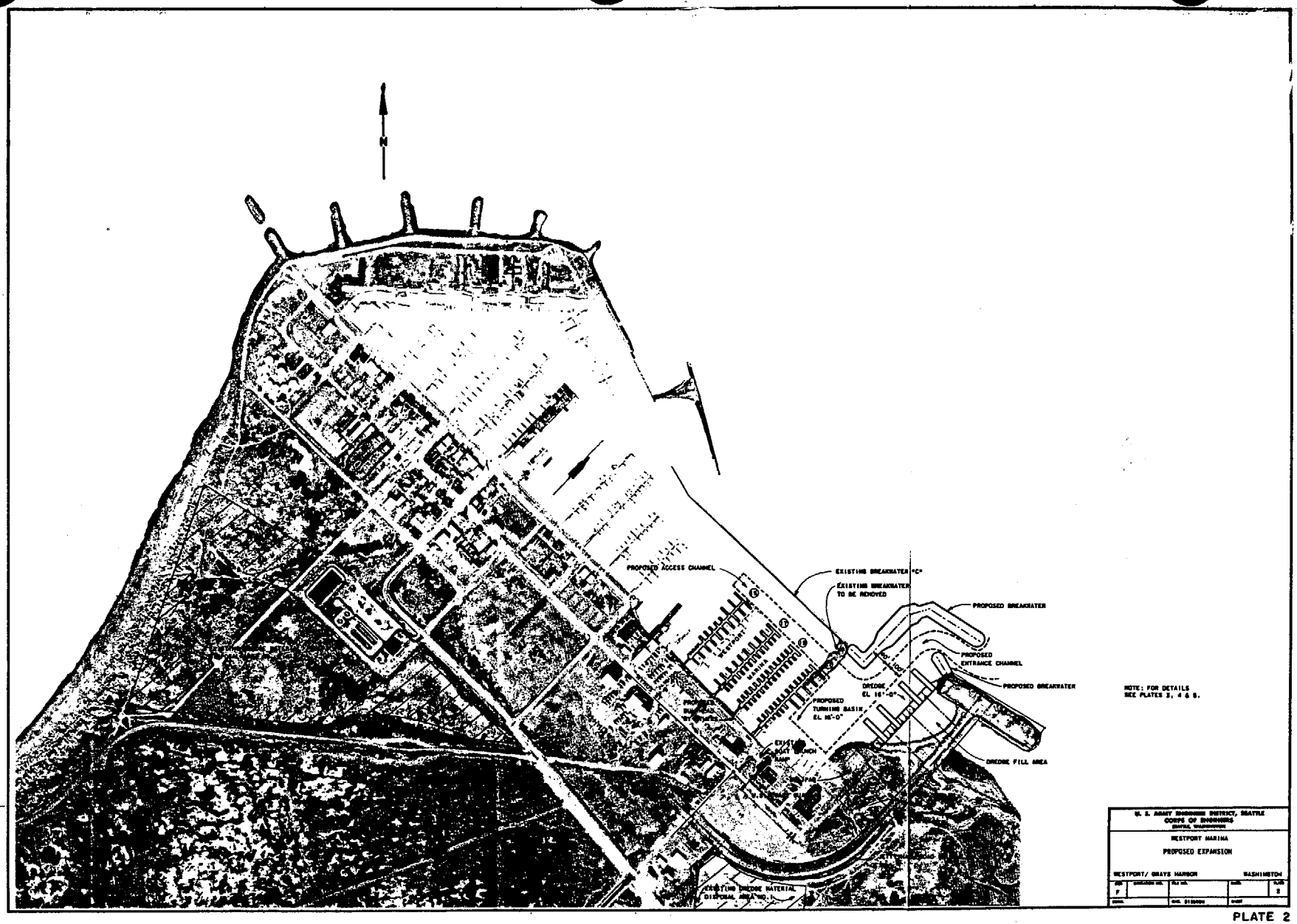


PLATE 2

Figure 11. Westport Marina

F. MEANS OF IMPLEMENTATION

1. The GHEMP contains several mechanisms to implement both protection and development of the estuary. They include:

a. A commitment by the various participating parties to utilize the plan in their decisionmaking and abide by the precepts of the plan insofar as provisions of law allow.

b. Permanent protection of a vulnerable area in MU 12 (Area 1) as a natural area.

c. Predesignation of MU 12 for non-disposal/fill in Area 1 and Areas 2 and 3 for the discharge of dredged or fill materials for water dependent industrial uses.

d. Establishment of an intergovernmentally recognized balance of estuarine use and protection which will only be changed through the amendment process after Task Force review.

2. Various additional means of implementing the GHEMP to either facilitate development or provide more permanent protection of the aquatic resources are considered below.

a. Regional Permit.

(1). Although not a requirement of plan implementation, the U.S. Army Corps of Engineers, Seattle District, is considering the development of a Regional Permit for certain work in tidal waters of the estuary from Montesano to the Pacific Ocean. The proposed Regional Permit would implement Section 10 of the Rivers and Harbors Act of March 3, 1899 (33 U.S.C. 403), and Section 404 of the Clean Water Act. The work which would be authorized by the proposed Regional Permit could proceed on the basis of the Regional Permit without the requirement for an individual project specific permit. The project authorized by such a Regional Permit might be limited to some of those identified by the GHEMP as a "Permitted Activity." The Regional Permit would only satisfy Federal law and not State and local requirements including leasing of submerged lands, zoning, building, hydraulic, encroachment, or other required permits. The projects could proceed only after final approval was obtained from State and local authorities.

(2). The Regional Permit would authorize projects of restricted scope, size, and waterward encroachment. By regulation Regional Permits can not apply to projects or activities whose impacts are significant either individually or cumulatively.

(3). The Seattle District would not issue the proposed Regional Permit until GHEMP is found to be acceptable and incorporated as State regulation through local SMP's.

(4). The purpose of a Regional Permit is to minimize "red tape" for projects deemed nonsignificant and administratively allow a greater emphasis to be placed on those applications which may have a significant impact on the human environment.

b. Section 404 of the Clean Water Act. The CWA has two provisions which may provide additional (but not necessarily permanent) protection for aquatic areas.

(1). §404(b)(1) - Advanced Identification of Disposal Areas

(a). The 404(b)(1) Guidelines state:

> The identification of any area as a possible future disposal site should not be deemed to constitute a permit for the discharge of dredged or fill material within such area or a specification of a disposal site. The identification of areas that generally will not be available for disposal sites specification should not be deemed as prohibiting applications for permits to discharge dredged or fill materials in such areas. Either type of identification constitutes information to facilitate individual or General permit application and processing. (§230.80(b))

(b). The Guidelines further state:

> To provide the basis for advanced identification of disposal areas, and areas unsuitable for disposal, EPA and the permitting authority shall consider the likelihood that use of the area in question for dredged or fill material disposal will comply with these Guidelines. To facilitate this analysis, EPA and the permitting authority should review available water resources management data including data available from the public, other Federal and State agencies, and information from approved Coastal Zone Mangement Programs and River Basin Plans. (Emphasis added, §230.80(d))

(c). As previously stated, the plan calls for the use of advanced identification for MU 12, Area 1 (non-disposal) and Areas 2 and 3 (disposal). EPA would evaluate the applications by the Port of Grays Harbor when they are submitted. EPA is currently considering the option of deleting the advanced identification process from the §404(b)(1) Guidelines since §230.80 contains no truly regulatory (mandatory) language, but it may be provided in a Guidance document where other non-regulatory information will be presented.

(d). Additional areas of the estuary could be designated as non-disposal sites under these provisions. The major impact of this action would be to limit or prohibit dredge material disposal in MU 43 since in-water disposal in the other parts of the estuary (MU 44) is unlikely, with the exception of the "scour" area at the entrance of the estuary. The Corps has made a finding that ocean disposal and uplands disposal have lesser environmental impacts than disposal in the estuary's aquatic area and that any future estuarine fill would be acceptable only if consistent with the GHEMP.

(e). Advanced identification for nondisposal areas would not necessarily preclude applications for future habitat enhancement projects. Any such proposals would need to be reviewed by all affected resource agencies to ensure that the habitat trade-offs are acceptable.

(2). §404(c) of the CWA. The 404(c) regulations authorize the Administrator of EPA to exercise a veto over the specification by the Corps or a state (if they administer the 404 program) of a site for the discharge of dredged or fill material either before or after a permit application has been submitted.

(a). The regulations apply whenever the Administrator is considering whether the specification of any defined areas as a disposal site should be prohibited, denied, restricted, or withdrawn; and, to all existing, proposed or potential disposal sites for discharges of dredged or fill materials into navigable waters. (§923.1(c))

(b). The purpose is to prohibit or restrict a site whenever the Administrator determines that the discharge of dredged or fill material is having or will have an "unacceptable adverse effect" on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas. (§ 923.1(2)) It is doubtful that municipal water supplies would be impacted by dredged or fill material in the Grays Harbor setting, but 404(c) might apply to the other resources mentioned.

(c). This seldom used provision of law could be useful if there are significant threats to the specific resources mentioned. It is one method which can provide additional protection to various parts of the estuary. The key to its use would be that the Administrator of the EPA would have to make a determination that the discharge of dredged or fill material will have an unacceptable adverse effect (defined in §231.2(e)) on the resources within existing, proposed or potential disposal sites. EPA's definition of "unacceptable adverse effect" is similar for all intents and purposes as that in the GHEMP.

(d). It is not the intent of 404(c) to designate vast bodies of waters and aquatic habitats ahead of time and "lock" them up. Rather, there should be an actual or implied threat to the resources which is serious enough to warrant the administrative actions required under §231. This management tool could best be used in the context of any future actions which are not consistent with the plan and which have not been properly amended into the plan. The Corps current policy on the disposal of dredged or fill materials is declared in recent EIS's on Operation and Maintenance, and Widening and Deepening. Dredged or fill materials disposal would be permissible if consistent with the plan, for possible enhancement projects, ocean and upland disposal, and in the scour area near the entrance to the navigation channel.

(e). One area that does deserve serious consideration for §404(c) designation is that area known as the "fish base" in MU 15 which has been clearly identified as being significant habitat for juvenile chum and chinook slamon and which is facing significant pressure for future filling.

c. Acquisition Alternatives

(1). Wetland and floodplain preservation through acquisition is an alternative to regulation. It is generally more acceptable, more permanent, and more easily enforced than regulatory programs, and eliminates the issue of the "taking" of property without just compensation. It can be initiated

by local governments, State and Federal agencies, and private or public groups through acquisition in fee; fee with retention of a life estate or lesser estate, purchase of easements; and purchase of development rights. Acquisition in fee has been the most widely used method in the acquisition of both wetlands and floodplains, since in most cases it is simpler, less controversial and more cost-effective than other forms of acquisition.[1]

(2). With the exceptions of MU 6 and MU 12, Area 1, the plan is silent but does not prohibit such actions if a group, organization or agency felt a particular resource needed such protection. Areas which might be considered under these alternatives might include Natural, Conservancy or Rural Low Intensity designated environments and MU's, especially those waterward of the 404 line, surrounding uplands or diked wetlands. Acquisition, particularly of diked wetlands will definitely be considered in the future Mitigation Plan and has been applied to the Ocean Shore Airport project and the ITT-Rayonier fill site east of the Bowerman Basin.

(3). Currently there are no known public or private organizations or entities which have shown an intent to acquire lands to provide a more permanent protection to any specific resource. In 1977, the U.S. Fish and Wildlife Service (Region I, Portland, Oregon) prepared a "Concept Plan for Waterfowl Wintering Habitat Preservation - Priority Categories 14 and 15," in which sites were evaluated for the purpose of determining piority acquisition through the use of Migratory Bird funds. Washington State winter habitat was ranked eighth nationally, with Grays Harbor being identified as the third most important habitat in the final ranking after Willapa Bay and Port Susan. To date no affirmative action has been taken to acquire Grays Harbor wetlands for inclusion in the National Wildlife Refuge System.

(4). Plan implementation does not preclude any future proposals for consideration and designation of Federal, State or local parks and wildlife refuges.

d. No Commitment

(1). It is possible to implement the GHEMP without any type of commitment from Federal agencies to consider the plan in their permit decision-making process; however, it would not achieve the goals set out by the various agency representative as discussed in Part II: Purpose and Need. Most agencies are encouraged under their existing statutes and regualtions to collaborate in comprehensive planning to minimize resource conflicts with State and local governments. With no agency commitment, the GHEMP would simply be another local SMP; conflict and delay would likely continue.

(2). Without Federal agency commitment to the plan, local commitment to the plan and its implementation is also unlikley. Absence of federal commitment will lead to the no action alternative discussed earlier.

(3). Local governments have invited substantive Federal agency participation in the design of local land use decisions in the estuary in order to minimize future conflicts. Local governments could adopt the plan or portions of it and at least ensure that shoreline management permits are consistent with the plan, even without federal agency action.

1. Environmental Law Institute, National Wetlands Newsletter, Vol. 1, No. 4, March 1979.

G. MITIGATION

1. Mitigation is an important tool in providing for the overall "balance" which the Task Force has attempted to achieve and aims to maintain. The GHEMP is concerned mainly with the impacts associated with future fill sites related to economic growth (especially port/industrial expansion) and projects of convenience and necessity such as airports and marinas. Mitigation is discussed generally in the plan (GHEMP, pp 26-27) and specifically for various special projects which are expected to take place within the long-range timeframe of the plan (e.g., see implementing conditions associated with MU 12 including transfer of title of lands, limitations on piers, airport expansion, etc.).

2. By establishing a balance (or more precisely an acceptable baseline between economic development and environmental protection), the plan notes that future amendments to the plan which may upset the balance might not be allowed because of its adverse effect on the balance of the plan or that it may be possible to preserve the balance through mitigation of adverse effects (GHEMP, p. 26).

3. The plan calls for the development of a Mitigation Plan for the estuary as a future course of action. The Task Force has not yet developed or approved such a plan but would do so if the GHEMP is approved. The GHRPC has taken a first step in the development of a Mitigation Plan by preparing a preliminary/background report which inventoried those potential mitigation sites in the estuary which may offer some of the best opportunities for mitigation as defined in the GHEMP. Figure 12 shows where these sites have been preliminarily identified.

4. The plan requires specific mitigation of the adverse impacts associated with any future large scale port development in MU 12. These steps are generally consistent with the Council on Environnmental Quality's definition of mitigation (40 CFR Part 1508.20(a-e)) as shown below.

a. Avoiding the impact altogether by not taking a certain action or parts of an action;

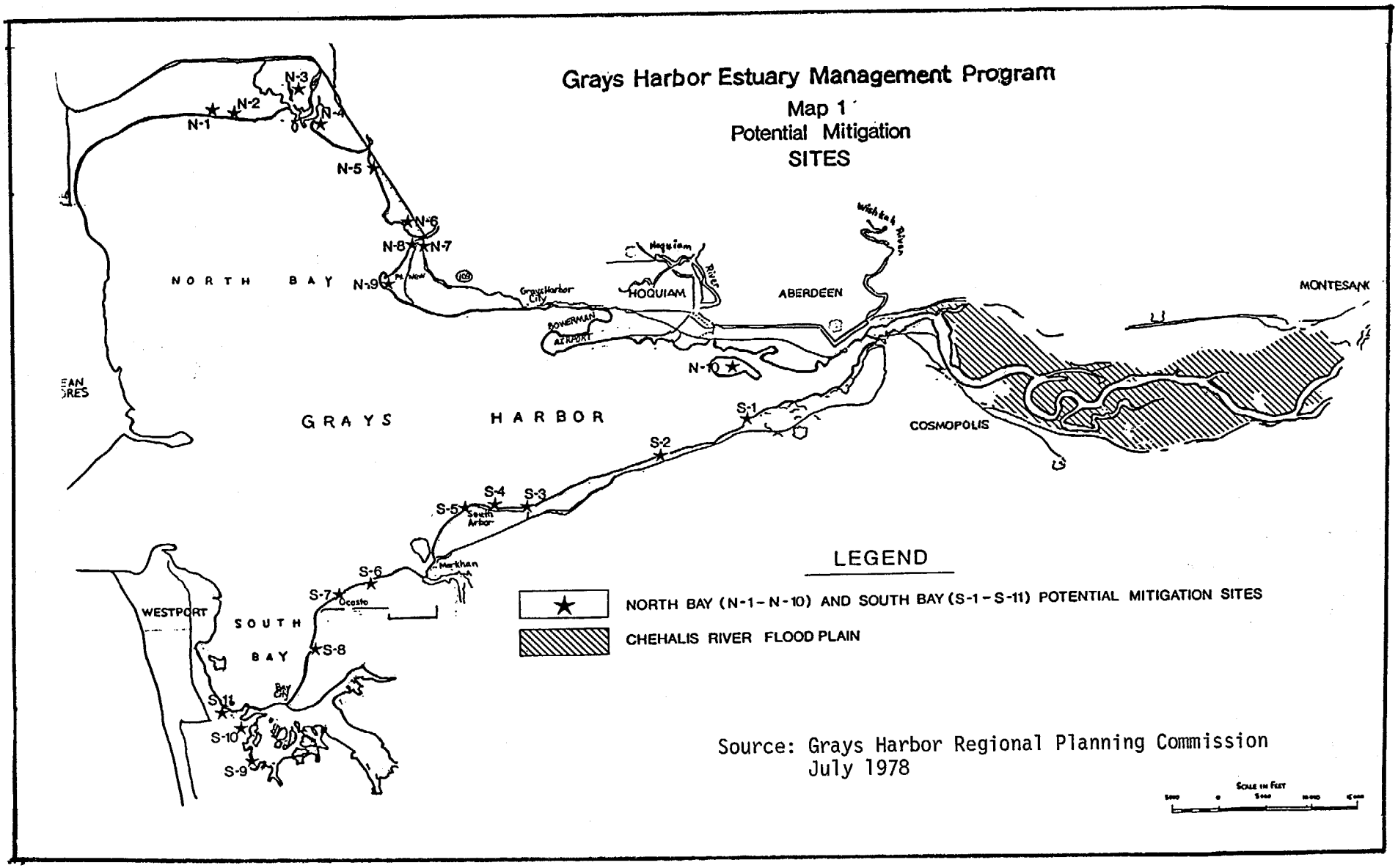
(1). A compromise would not allow total avoidance of the impacts.

b. Minimizing impacts by limiting the degree of magnitude of the action and its implementation;

(1). Minimizing fill area from 2200 acres to 264 acres - with possible addition of 246 acres in Unit 12 or elsewhere.

(2). Minimizing Area 2 fill to that area required to provide a rail loop transportation system for multi-commodity, bulk loading and off-loading facility.

(3). Minimizing Area 3 fill to that required for an ILS Commuter Airport but not more than 750 feet to the north.



Source: Grays Harbor Regional Planning Commission
July 1978

FIGURE 12

(4). Phase filling to allow for impact evaluation. Implementation Condition #3, Area 3 reads as follows:

> If Area 2 is filled prior to a permit application to fill in Area 3, an evaluation of the effects of filling in Area 2 will be conducted as a part of the permit review process. The primary purpose of that evaluation will be to determine whether environmental conditions have changed sufficiently as a result of Area 2 fill to demonstrate that other alternative airport sites would be less environmentally damaging. (GHEMP, p. 64)

c. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

(1). With concurrence of state and Federal resource agencies, recreate lost habitat on the north sides of Areas 2 and 3 for vegetated salt marshes and woody vegetation and perching sites for birds.

(2). Department of Game will prepare management plans with the advise from a Bowerman Basin Advisory Council which will include environmental interest groups and citizens.

d. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action;

(1). 1700 acres of habitat will be preserved, especially critical eastern section of the Bowerman Basin used for both feeding and roosting habitat.

(2). Preserving other significant shorebird and waterfowl habitat throughout the estuary.

(3). Maintaining water quality in Area 1 through containment structures surrounding each fill.

e. Compensating for the impact by replacing or providing substitute resource or environments.

(1). Area 1 land will be acquired through fee title.

(2). In-kind habitat replacement is associated with some activities but not all.

5. The plan also discusses the potential for enhancement or the manipulation or modification of the system to increase productivity. The plan does not generally endorse specifics but treats this activity as other activities and sets a context and establishes limits within which potential enhancement projects can be evaluated and permitted. Some enhancement concepts are included in the mitigation measures discussed in the plan amendment procedures. Enhancement activities are specified in the development of the Ocean Shores Airport (marsh restoration) and the Bowerman industrial area (shorebird habitat improvement).

6. The plan is generally consistent with the §404(b)(1) Guidelines which state: "...no discharge of dredged or fill material shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem." §230.10(d). Some of the possible ways to minimize adverse impacts include: (§230.70, 75)

a. confining the discharge; (GHEMP, p. 64, Condition 5)

b. use previous dredged material disposal sites; (MU 12, Areas 2 & 3)

c. avoid changes in water current and circulation patterns; (preserving MU 12, Area 1, avoids significant circulation pattern changes)

d. avoid sites having unique habitat or other value, including habitat of threatened or endangered species; (partially met in MU 12, but plan as a whole avoids and protects other significant sites utilized by shorebirds and falcons and unique fisheries habitat)

e. use planning and construction practices to institute habitat development and restoration to produce a new or modified environmental state; (if desirable and feasible, such projects are permitted and encouraged by the plan)

f. timing discharge to avoid spawning or migration seasons and other biologically critical time periods; (plan states that discharge activities will be consistent with permit requirements) and,

g. avoid the destruction of remnant natural sites within areas already affected by development (plan does this for fisheries habitat in urban environment, Area 1 in MU 17 which is the most natural area remaining in the Bowerman Basin).

7. Overall, the GHEMP has a number of elements which will help minimize future adverse impacts including:

a. greater specificity controlling future development;

b. specific requirements which prohibit certain actions which would have an unacceptable impact and requirements to minimize impacts associated with other actions to include mitigation, monitoring and enhancement projects;

c. potential phaseout of log rafting;

d. better utilization of existing urban environments to provide a more attractive environment;

e. phase development which will allow monitoring of impacts; and

f. limiting airport development to the minimum amount of space required.

PART III: AFFECTED ENVIRONMENT

PART III: AFFECTED ENVIRONMENT

A. General Setting

1. Grays Harbor is one of the Pacific Coast's six major estuary systems. Located on the southern Washington coast, this area lies 110 miles south of the Straits of Juan de Fuca and about 45 miles north of the mouth of the Columbia River (see backside front cover for location map). The 91 square mile estuary is approximately 13 miles at its widest point and narrowing to less than 100 yards in its upper reach nearly 32 miles from the estuary mouth. The three corners of the estuary are defined by the mouth of the Chehalis River flowing into the eastern portion of the harbor; the North Bay, which receives the waters of the Humptulips River; and the South Bay, into which the Elk River and Johns River flow. The Wishkah River is tributary to the Chehalis near the latter's mouth at the harbor, and a little further west from the Wishkah, the Hoquiam River flows into the estuary. Four major islands of the estuary are Goose and Sand Islands (North Bay); Whitcomb Island (South Bay); and Rennie Island to the east, near the mouth of the Chehalis River. Rennie Island, measuring about 1.5 miles across, is the largest of the four, while the other three are each approximately one-half to three-quarters of a mile in length.

2. Geologically, the estuary is a drowned portion of the Chehalis River Valley, and is continually being filled in with riverborne sediments and oceanic materials. The surrounding uplands are composed of unconsolidated Pleistocene silt, sand and gravel, which are sedimentary and volcanic rocks of the Tertiary Age that form low relief hills. The predominant physical feature of the estuary is the vast amount of intertidal mud and sandflats.

3. The climate of the area is dominated by the influence of the Pacific Ocean, typically mild, dry summers and mild, wet, cloudy winters. The yearly mean temperature is 50°F, the warmest month being August, with an average temperature of 70°F, while the coldest month, January, averages 34°F. Winter winds, with gusts ranging from 35 to 50 mph, are from the south to southwest. Spring and summer winds are from the west to northwest and are steadier with fewer gusts, with velocities ranging from 15 to 20 mph.

4. Grays Harbor is an area of diverse uses. The harbor lies wholly within Grays Harbor County. The cities of Aberdeen, Hoquiam and Cosmopolis are situated in the estuary's upper reaches, and their economies depend in large part upon Grays Harbor as a medium for fishing, shipping and trading and are heavily industrialized. The cities of Westport and Ocean Shores lie on the south and north entrance to the harbor with their economies being more fishing and recreation oriented. The region is served by rail from the east; highway linkages from the east, south and north; by a 5,000-foot runway airport; and by a -30 feet mean lower low water (MLLW) navigation channel. Population ranges from 18,550 for Aberdeen to 1,570 for Cosmopolis.

B. Use of Inventory Data in the Planning Process

1. The physical, biological, and socioeconomic characteristics of Grays Harbor were summarized by a technical team familiar with the area prior to the development of the first draft of the GHEMP. This information was summarized and displayed using graphics, technical reports and interview-response summaries. That information base was used by the Planning Task Force in its initial work to develop the first draft of the plan.

2. The major purposes of the data inventory were to:

a. Provide the Task Force with information on which to base decisions.

b. Provide the general public with a reference base to test the recommendations of the task force.

c. Provide a continuing reference source for future planning, development and management decisions.

The initial step in the planning process was to conduct a detailed inventory of the physical, biological and socioeconomic resources of Grays Harbor. A special team of experts, each member representing specific technical disciplines (i.e. economics, forestry, fisheries, etc.) was formed (see appendix H-1). The function of this team was to assist in the collection and review of the known technical information on Grays Harbor. The team further served to arbitrate apparent information conflicts and to provide the Task Force with a reservoir of diverse technical expertise.

3. The various local and special interest groups, individuals and agencies concerned with the planning area were identified. These groups, individuals and agencies (see appendix H-2) were then contacted and given a summary paper which outlined the background, process and intent of the planning program. Each group or individual was then interviewed using a standard interview format. The results of these interviews were then summarized to provide a general profile of what a cross section of the public felt should be protected, developed or of management concern. The interviews were also used to obtain unwritten historical and other information on the area. Opinions on facts listed on the data maps and reports were also solicited. A total of 68 interview sessions were conducted and the results summarized.[1]

4. The purpose of the detailed data collection, verification and interview process was to develop an accurate profile of the Grays Harbor estuary. Obtaining this information was necessary before any deliberations or decisions could be made by the Planning Task Force or general public on what the plan should do for Grays Harbor. The data collected were translated graphically into fourteen large scale (1" = 1000') data maps describing the area. A series of technical memoranda, summaries of the interviews, and an annotated bibliography of all known publications on Grays Harbor were prepared for the Grays Harbor Estuary Management Program. The publication described the planning process and how it was to provide and solicit general public ideas and concerns.

1. Montagne-Bierly Associates Inc., Grays Harbor Estuary Management Program - Phase I, Summary of Interviews, pp. 136-153.

5. The technical team's efforts resulted in the presentation of data maps, public opinion and technical memoranda to the Planning Task Force at its initial workshop. The fourteen data maps were displayed at each workshop and were a continuous reference tool for the Task Force during the development of the first draft of the Estuary Plan.

6. The following sections on the description of the environment are supplemented by the Data Maps (Attachment 1) to this PDEIS.[1] They summarize in graphic form a great deal of data gathered by the technical teams and used by the Task Force in making preliminary decisions. In addition, an expanded discussion of the three major environments (physical, biological and socio-economic) can be found in Grays Harbor Estuary Management Program: Technical Memoranda, pp. 1-110 (available upon request from OCZM). Additional references in which the Grays Harbor Estuary environment is discussed at length include:

a. U.S. Army Corps of Engineers, Seattle District, Maintenance Dredging and the Environment of Grays Harbor, Washington, Appendices A-N, 1976.

b. U.S. Army Corps of Engineers, Seattle District, Long-Range Maintenance Dredging Program - Grays Harbor and Chehalis River Navigation Project Operation and Maintenance, "Final Environmental Impact Statement Supplement No. 2," 1980.

c. U.S. Army Corps of Engineers, Seattle District, Grays Harbor, Chehalis and Hoquiam Rivers, Washington - Channel Improvements for Navigation. "Interim Feasibility Report and Final Environmental Impact Statement," 1982.

d. Sharpe, Grant W., An Interpretive Survey of the Grays Harbor Area, prepared for the Army Corps of Engineers, 1977.

1. The orignial fourteen data maps have been combined into ten maps. Attach. I will not be redistributed with the PFEIS; please save it for future reference.

C. Physical Environment

1. Hydrology (see attach. 1, map 6 - Hydrology & Flood Plain)

a. Grays Harbor Estuary is fed by a 2,550 square mile drainage basin. Tributary rivers include the Chehalis, Hoquiam, Wishkah, Humptulips, Johns and Elk River basins. Seven sub-river basins, comprising the Chehalis and the Johns Rivers, feed fresh water into the estuary. The Chehalis is the largest basin and constitutes the major fresh water source for Grays Harbor. Providing roughly 80 percent of the fresh water to the estuary, the Chehalis' inflow is a primary reason why Grays Harbor is classified as a positive estuary, in which precipitation and runoff exceed evaporation, and the net surface flow is seaward (see figure 13). Precipitation is high, increasing from about 80 inches (200 cm.) near the estuary to over 220 inches (550 cm.) in the higher reaches of the watershed.

b. Because of the winter storms, streams feeding Grays Harbor are characterized by higher winter flows and low summer flows. Mixing of fresh water and salt water in the mid-portion of the estuary (Aberdeen-Hoquiam area) creates environments ranging from low salinity (five parts per thousand) during the winter to higher salinities (20 parts per thousand) during the summer months. The winter salt water wedge or upstream limit of intrusion stops at the Aberdeen-Hoquiam area and the summer upstream limit some 10 to 12 miles further up the Chehalis River (see figure 14).

c. The estuary itself is a shallow basin with depths averaging less than 20 feet. In the harbor entrance depths reach a maximum of 80 feet, while the navigational channel is maintained at the -30 feet mean lower low water (MLLW) level by annual dredging of bottom materials and is being considered for widening and deepening to -38 feet MLLW. The surface area varies from about 91 square miles at mean higher high water (MHHW) to about 38 square miles at MLLW, providing 53 square miles (nearly 34,000 acres) of intertidal lands (Corps, Widening & Deepening, 1982). Much of the tidal flat area is about 1 to 2 feet above MLLW and is important in the movement, mixing, and reaeration of harbor waters during tidal ebb and flood.[1]

d. Grays Harbor is subject to the North Pacific's diurnal tide system (two high tides and two low tides daily). The upper limit of the tidal influence is Montesano, approximately 32 miles from the harbor entrance. On an annual basis the mean daily tidal range is 10 feet in the Aberdeen-Hoquiam area.

e. Tides move slowly up the estuary; high tide occurs 29 minutes later at Aberdeen than at the harbor mouth. Maximum mean velocities in the upper harbor vary from about 3 feet per second (fps) during floodtide to about 4.5 fps during ebbtide.[1]

f. The estuary is often divided into the outer harbor extending east from the Pacific Ocean to about Point New, and the inner harbor extending east from about Point New to Cosmopolis. Also, five physical units of the Grays Harbor estuary are often referred to:

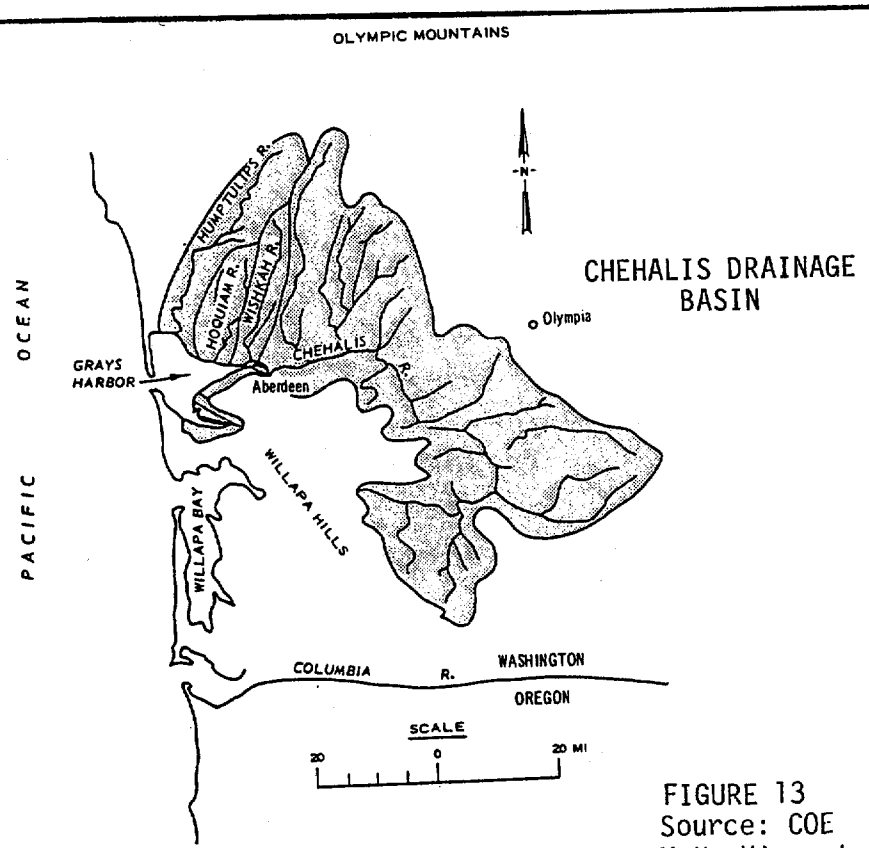


FIGURE 13
Source: COE
M.K. Vincent, 78

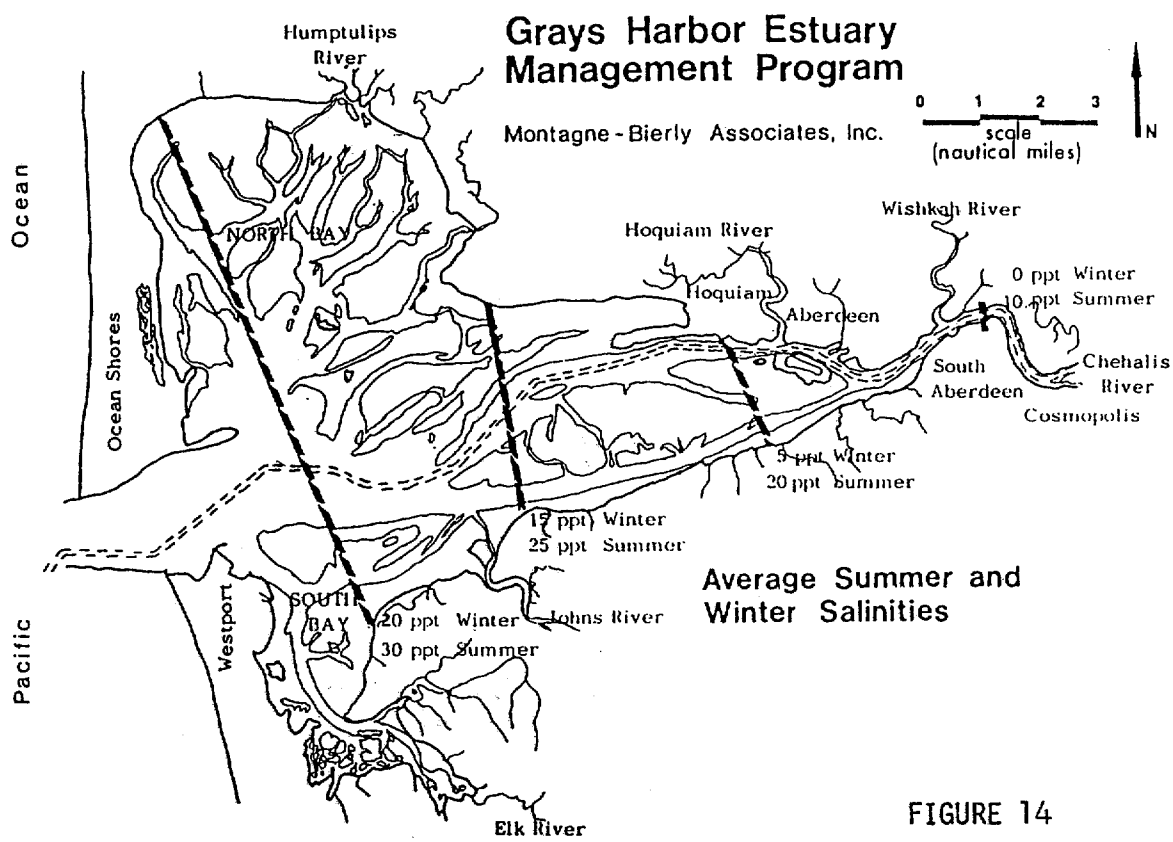
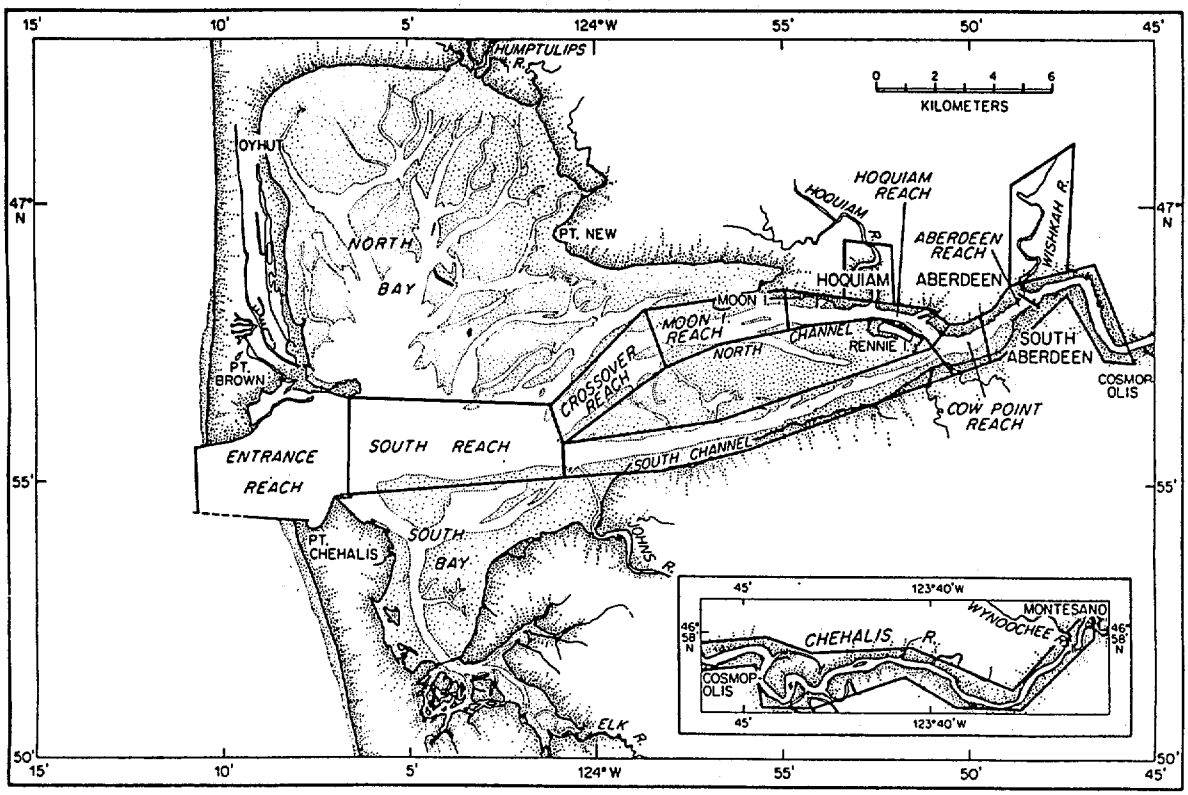


FIGURE 14
Source: Herrmann (1972)

```
          --------
         /  North  \
------/    Bay    ------------------------------------
Entrance/          /Central Bay/Chehalis River Wetlands
------|  - - -      _--------------------------------
       | South    -
       |  Bay   /
        |      |
         -----
```

When considering Grays Harbor as an aggregate of socioeconomic and physical features, these five physical units may be further expanded to eight major planning units (as designated in the GHEMP). North Bay comprises the largest planning unit with about one-fourth of the total surface area, followed by Central Bay, South Bay, and the Chehalis Wetlands. For purposes of maintenance dredging, the Corps further subdivides the navigation channel into eight units as identified in figure 15.[2]

FIGURE 15



g. Ground water is not heavily used in the Grays Harbor area. Sand and gravel deposits related to the recent alluvium along the lower Chehalis River could be a source of domestic and industrial water. These sources are high quality and available in relatively large quantities (several thousand gallons/minute).[3]

2. Geology

a. On the north, east and south, the harbor is bounded by low hills, composed of Pleistocene silt, sand and gravel, as well as harder sedimentary deposits and volcanic rocks of Tertiary age. The outer harbor is composed of marine sediments, the inner Harbor of eroded sediments from the drainage basin, with a transition zone between these two regions. It is estimated that sediment transport into the estuary by the Chehalis River system is about two million cubic yards per year. The majority of these fluvial sediments enter the estuary in the winter during high flows; the Satsop and Wynoochee subbasins discharge the major portion. Likewise, it is estimated that a similar amount of marine sediments enters the mouth of the estuary on a yearly basis.[3] The majority of the sediment in the central and lower third of the estuary is of marine origin (containing less silt and higher sand content). The North Bay, South Bay and the upper two-thirds of the estuary contain a mixture of marine and river sediments (see attach. 1, map 7, Soils and Sediments).

b. Several types of soils predominate in various sections of the estuary. While sandy soils are dominant in the Ocean Shores and Westport areas, peat lined with clayey soils occurs in the section between Cosmopolis and Montesano, and most drainage areas are composed of clayey soils. The area of Aberdeen and Hoquiam is primarily built on fill material. The peat dominated soils provide a serious limitation to development.

c. Topographically, the Chehalis River Valley formation was influenced by debris left by the advance of the Vashon Glacier southward from Puget Sound some 15,000 years ago. Glacial debris can be found east of Grays Harbor and along the banks of the present channel of the Chehalis River, which drained a major portion of the Puget Sound during that glacial period. Thus, Grays Harbor has been formed into a series of small drainage valleys which cut through low but rugged hills with a maximum elevation of 2,400 feet. Level land is scarce and is generally created by the processes of marsh building, estuarine deposition, stream process, or manmade fill. Erosion in the estuary area can be a serious problem, especially during storms and high tides. Jetty structures at the harbor entrance and navigation structures along the main channels must be protected during these periods. The erosion problems of the area are more completely addressed in the Grays Harbor Erosion Management Study.[4]

d. The estuary contains numerous shallow channels created by ebbtide flows and river discharges. Historically, there were three main channels running east to west. These were the North, Middle and South Channels. In the past, all three maintained depths of about -17 to -20 MLLW with areas of shoaling. The three still exist, but the North Channel is dredged for navigation purposes and is the major ship channel to Aberdeen and Cosmopolis. The other two have shoaled to shallow depths.[3]

3. Water Quality

a. The estuary is a partially mixed system in which tidal flows dominate river flows and nearly complete mixing of fresh and salt water occurs. The low fresh water inflow in summer and the large estuary volume create a "giant bathtub" effect in the central portion of the estuary. Pollutants entering this area are not flushed rapidly and contribute to reduced water quality in that reach. The mid-reach of the estuary from Cosmopolis to a line between Point New and Markham has had a history of poor water quality since the earliest recorded water quality measurements were taken.

b. The areas in Grays Harbor with substandard water quality are the result of both point and nonpoint sources. The major point sources consist of municipal and industrial discharges which affect dissolved oxygen levels (D.O.), turbidity, color, and bacterial contamination. The wood products industry is considered to be the largest volume contributor of oxygen demanding wastes (historically considered the primary water quality problem in the estuary), particularly from sulfite liquors. Nonpoint source contamination includes surface runoff from both urban development and the general watershed, garbage and wood waste land fills, septic tank leachates, dredging and log storage wastes.

c. The overall water quality of Grays Harbor is seriously affected by the estuary's declining capacity to assimilate wastes. Thus, the level of past and present industrial discharges has had a major impact on the quality of the water. Wastes often accumulate as a result of low river inflows and limited flushing which, in concert with heavy sedimentation from the Chehalis River, contribute to low oxygen levels in the water. Though water quality has improved in the last 10 years, additional organic waste discharge above present levels could reverse this trend.[5]

d. During 1980 and 1981, the Corps performed comprehensive sediment sampling and elutriate testing for contaminants in Grays Harbor. The results indicated that contaminant concentrations in the sediments increase toward the inner harbor as the sediments become finer. Copper, zinc, PCB's and BHC exceeded existing EPA criteria in some sections of the estuary. Some of the sediments in the Hoquiam and Cow Point reaches could result in contaminant bioaccumulation in tissues of marine organisms if sediments are discharged in open water. Consequently, there is need for some confined disposal associated with the proposed widening and deeping project.[2]

4. Air Quality

a. Both localized and general air pollution occur in Grays Harbor. Nonstationary pollution sources include vehicular and marine traffic which emits carbon monoxide, oxides of nitrogen, and unburned hydrocarbons. There is low-level but measurable air pollution from industrial sources in the Aberdeen-Hoquiam-Cosmopolis complex to the east. Localized air pollution problems can occur as a result of high winds that hold emission plumes close to the ground near the source. Suspended particulates in the outer harbor average 35 micrograms per cubic meter (ug/m^3) while those in the Aberdeen area show an annual mean of 40 ug/m^3. Both are well below the National Ambient Air Quality Standard (75 ug/m^3) and the Washington State Ambient Air Quality Standard (60ug/m^3) for high volume suspended particulates.[6]

D. Biological Environment

1. Habitats

a. A diversity of habitats in and around the Grays Harbor Estuary have been described including upland forests, lowland forests, adjacent floodplains (urban and agricultural lands, ponds, lagoons, sloughs and freshwater swamps), coastal dunes, marshlands (fresh and saltwater), intertidal flats (mud and sand), eelgrass flats, subtidal or channel, and the man-made jetty habitat that supports a distinct though small rocky coast marine community.[1,3] Habitat types are made distinctive by virtue of one or more characteristics: substrate type; elevation with respect to tidal influence; and predominant vegetation.[6] Salinity is another important factor in determining the type of habitat which develops at a given site (NMFS, personal communication).

b. The abundant wildlife which have been identified in the estuary are in response to this wide diversity of habitats, a moderate climate and relatively low intensity urban and industrial disturbances. There are at least 52 known species of fish, 326 species of birds and over 50 species of mammals that utilize the estuary. See appendix I for species lists with common and scientific nomenclature.

c. Several food chain pathways found in Grays Harbor ecosystems have demonstrated the extent and persistence of interdependent relationships throughout the flora and fauna of the estuary.[2] One example might include the eelgrass habitat which is of particular importance in the estuary, as it provides food, shelter, and substrate for an abundance of marine organisms and increases the biological productivity and diversity of the estuary.[6]

(1). Eelgrass habitat is significant as an ecological link between other estuarine and offshore habitat types. Eelgrass produces an abundant yearly crop of vegetable matter which is exported from the immediate habitat as detritus. This material can be found almost anywhere within the estuary, as well as offshore along the continental shelf and on ocean beaches. It provides organisms in these habitats with a rich source of food during the less productive winter period.[6]

(2). A myriad of organisms inhabit eelgrass beds. Benthic fauna include nereid worms, clams, nematodes, and burrowing anemones. The leaves support isopods, amphipods, hydroids, bryzoa, harpacticoids, herring spawn, snails, limpets, protozoa, ciliates, and nudibranchs. Juvenile salmonids, striped sea perch, pipefish, and blennies find food and cover in the beds. The epibenthic area is home to flatfish (sole and flounder), crabs, and moon snails and is an important food item for waterfowl, especially black brant and widgeon.[6]

2. Vegetation (see attach. 1, map 8 - Vegetation)

a. Substantial areas of native vegetation remain in and around the Grays Harbor Estuary. Vegetation is important as it provides habitat (nesting and shelter) and food (seeds, detritus or decaying organic matter), stabilizes soils thereby minimizing erosion and siltation, helps to filter toxic substances from surrounding waters and absorb organic and mineral nutrients.[2]

b. Table 3 lists the characteristic species of the major vegetation types of the Grays Harbor Estuary.

TABLE 3

Characteristic Species of the Major Vegetation Types of Grays Harbor Estuary

	Vegetation Type					
	Eelgrass Bed	Salt Marsh	Freshwater Marsh	Lowland Forest	Upland Forest	Dune Vegetation
Common Eelgrass (*Zostera marina*)	x					
European Eelgrass (*Zostera noltii*)	x					
Pickleweed (*Salicornia virginica*)		x				
Arrow Grass (*Triglochin maritimum*)		x				
Sedge (*Carex lyngbyei*)		x				
Tufted Hairgrass (*Deschampsia caespitosa*)		x				
Salt Grass (*Distichlis spicata*)		x				
Slough Sedge (*Carex obnupta*)			x			
Red Canary Grass (*Phalaris arundinaceae*)			x			
Cattail (*Typha latifolia*)			x			
Sitka Spruce (*Picea sitchensis*)				x	x	x
Red Alder (*Alnus rubra*)				x		
Willow (*Salix* sp)				x		
Western Hemlock (*Tsuga heterophylli*)					x	
Coast Pine (*Pinus contorta*)						x
Beach Grass (*Amophila arenaria*)						x

c. The upland forests are dominated by Sitka spruce and western hemlock with some western red cedar and Douglas fir. The lowland forests generally occur in riparian environments associated with the floodway of streams or in the tidally-influenced portions of the Chehalis River upstream from Cosmopolis and are dominated by spruce, red alder, willow and crabapple. Ground cover is extremely dense due to an abudance of small tree and tall shrub species. The lowland forests are distinguished from the adjacent upland forests primarily by the abundance of deciduous species in the canopy. These environments are more fully described and delineated in Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies, "Chehalis River Floodplain Land Cover Mapping Between Aberdeen and Montesano, Washington," Corps of Engineers, 1980.

d. The dune vegetation complex comprises a variety of plant communities such as that found at Whitcomb Island to include American sea rocket, lime grass, dune grass and yellow abronia. These are pioneer species that are able to tolerate the harsh conditions of high salinity and abrasive soil action. Other areas of stabilized dunes are characterized by European beach grass, purple beach pea, beach morning glory and sea rocket. Behind the dunes are deflation plains characterized by moist soils which include sedges, rushes, and in some areas, shrubs or small trees of wax myrtle and willow. Stabilized upland dunes are invaded by Sitka spruce and shore pine.[3]

e. Wetland vegetation types in the estuary area are freshwater marsh, saltwater marsh and eelgrass communities.

(1). Freshwater marsh habitats are dominant in the Chehalis River and North Bay portions of the estuary. This habitat type is characterized by slough sedge, cow parsnip, cattails, spike rush, bullrush and reed canary grass. The locations that have been observed are those areas closely adjacent to the estuary at the upper end of tidally influenced creeks and are characterized by standing water for a substantial period of the year and by their accumulation of organic soils.

(2). Extensive saltwater marsh areas are located from the central portion of the estuary below Aberdeen throughout North and South Bays. There are basically two major types of salt marshes in Grays Harbor: high marshes and low marshes due to their intertidal or above mean tide elevation.

(a). Low marshes are dominated by succulent salt tolerant species. Pickle weed is characteristic of low marshes. Two major types of low marshes are developed depending upon the type of substrate available. Sandy substrates support marshes dominated by pickle weed and jaumea. Low marshes with silty subtrates are dominated by arrow grass, tufted hairgrass, pickle weed and Lyngby's sedge. These marshes are quite similiar in vegetation composition to the unconfined dredge material disposal sites that are newly colonized in the intertidal area except for greater plant density.

(b). High marshes are dominated by grass-like species, particularly tufted hairgrass, rushes, salt grass, bentgrass and sedge.

(c). Diking the saltwater marshes by tide-gating eliminates tidal saltwater influence and generally changes the plant species composition.

(d). Both fresh and saltwater marsh habitats have been significantly reduced in the Grays Harbor area through diking, filling, dredged material disposal and ditching. Because they are in a transitional zone between nearshore lowlands and the water, they are susceptible to alteration for use as pastureland or urban/industrial development. Today, emergent vegetation habitat comprises only 16 percent of the Grays Harbor intertidal area, representing a loss of approximately one-half of the previously existing wetlands.[6]

(3). Eelgrass occurs throughout the estuary below Aberdeen and at tidal elevations between -3 ft MLLW and +6 to +7 feet MLLW. Two species of eelgrass occur in Grays Harbor including common eelgrass (Zostera marina) and European eelgrass (Z. noltii) which occurs in the higher intertidal levels than the former and is most abundant between +5 and +6 MLLW.[3]

f. Seaweeds, algae and phytoplankton. Thom (1981),[8] noted 23 taxa of macroalgae in Grays Harbor. Among the most abundant and conspicuous are 3 species of green algae (Enteromorpha clathrata var. crinita, E. linza, E. intestinalis); a species of brown algae (Fucus distichus ssp. edentatus); 2 species of red algae (Polysiphonia hendryi var. deliquenscens and Porphyra sanjuanensis); and a complex of tube dwelling and fillamentous diatoms. Macroalgae's distribution is limited by availability of hard, stable substrata (e.g., logs, roots, boulders) for attachment.[2] No emergent vegetation exists in mudflat substrate and the predominant flora are restricted to epibenthic green and blue-green algae, with diatoms dominating the phytoplankton. On the sandflat substrate, no attached vegetation exists and there is very low epibenthic algal production. However, Thom does report dense mats of Vaucheria longicaulis and Rhizoclonium riparium growing in sand. Phytoplankton is the primary producer and organic detritus is generally less available than on the mudflats. While phytoplankton are the least productive plant group in the estuary, they are considered important primary producers which are the supply of food for zooplankton.

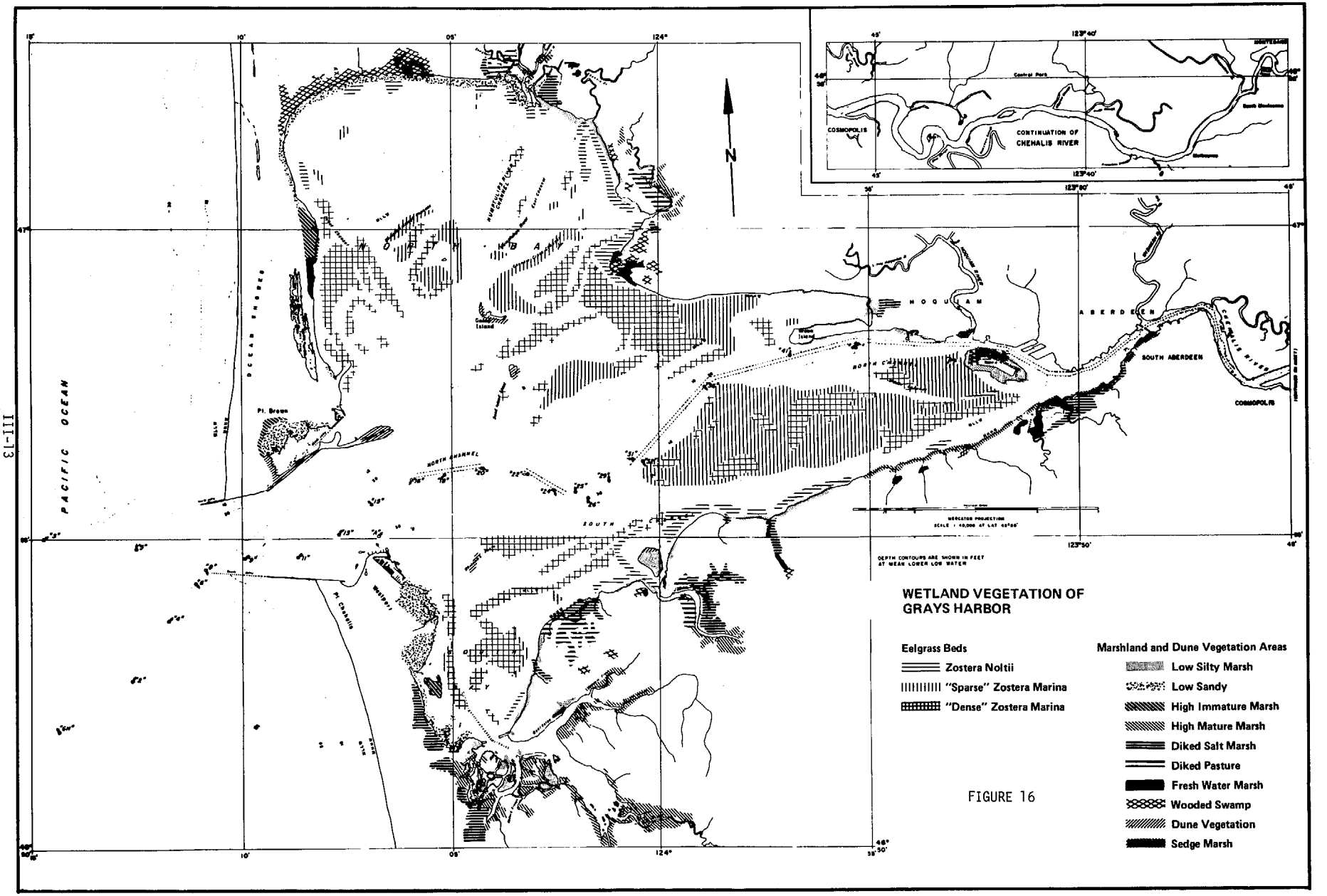
i. Table 4 compares primary production of several types of aquatic flora.[2]

TABLE 4. ORGANIC CARBON CONTRIBUTIONS (x 10^6kgC/yr) OF VARIOUS SOURCES WITHIN THE ESTUARY

Source	Inner Harbor	Outer Harbor	Entire Estuary
Marsh Phanerograms	3.36	12.6	16.0
Zostera spp. (eelgrass)	49.02	76.78	125.8
Benthic Algae	24.68	46.6	71.3
Phytoplankton	2.34	6.6	8.9
Total	73.40	142.6	222.0

Source: Thom, 1981

j. Figure 16 shows the location of the various types of wetlands vegetation.



WETLAND VEGETATION OF GRAYS HARBOR

FIGURE 16

k. Table 5 lists the extent of the acreage of intertidal habitats in Grays Harbor.

TABLE 5

ESTIMATED EXTENT OF INTERTIDAL HABITATS IN GRAYS HARBOR

	Hectares	Acres
Entire Harbor to Extreme High Water (EHW)	22,140	54,708
Intertidal from MLLW to EHW	13,600	33,606
Salt Marshes		
Low Marshes	919	2,271
High Marshes	514	1,270
Sedge Marsh	81	200
Diked Salt Marsh	441	1,090
Total Salt Marsh	1,955	4,831
Eelgrass Beds	4,740	11,712*
Tidal Flats Not Vegetated With Vascular Plants	6,905	17,062

Source: Corps of Engineers, Long-Range Maintenance Dredging Project, FEISS, No.2, 1980

* The extent of eelgrass beds is extremely variable. In 1977, G. H. Miller estimated the eelgrass habitat at 20,810 acres. The differences may be due to seasonal variability and/or sampler subjectivity.[7]

3. Wildlife (see attach. 1, map 8 - Wildlife)

a. Birds. A variety of birds characterize Grays Harbor Estuary. The major groups found in the estuary are waterfowl, shorebirds, fish-eating water-birds, gulls and terns, terrestrial birds and raptors.

(1). Waterfowl. Dominated by ducks, waterfowl counts in Grays Harbor peak during September, October, and November at approximately 45,000.[9] American widgeon, pintail, and mallard are the most abundant duck species. Scaup, canvasback, bufflehead, black brant, scoter, ruddy duck and green-winged teal are also common. Grays Harbor provides an important wintering area for canvasback and black brant.

(a). Waterfowl concentrate in abundance in the North Bay with large numbers also found in the undeveloped area of South Bay. South Channel is utilized more than the North Channel where there is some concentration around Rennie Island. Another attractive area for waterfowl in the inner harbor is the Bowerman Basin. Several hundred canvasback are frequently seen feeding in this area. Two or three thousand American widgeon, pintail, mallard and green-winged teal ducks are commonly seen feeding or resting in the salt marshes surrounding the basin.

(b). Dabbling ducks utilize the Chehalis River and are found in the sloughs and backwater areas that enter the Chehalis River. The tideland swamp area of the upper Chehalis River may provide important year-round habitat for wood ducks.

(2). Shorebirds. The Grays Harbor Estuary provides habitat for a large variety of both migratory and resident or wintering shorebirds. Approximately 24 species of shorebirds utilize the estuary as a stopover site, with western sandpiper being by far the most abundant during spring and fall migrations and dunlin being the dominant species during the winter months.[10] As a result of a recent survey conducted by Dr. Steven G. Herman and John B. Bulger on the distribution and abundance of shorebirds at Grays Harbor during the spring of 1981, they concluded that the estuary is host to more shorebirds than any other estuary along the Pacific Coast south of Alaska and that Grays Harbor is of extraordinary and critical importance to spring-migrating shorebirds on the Pacific Coast.[10] Other shorebirds using Grays Harbor are the least sandpiper, red knot, short-billed dowitcher, sanderling, semipalmated plover, ruddy turnstone, whimbrel, longbilled curlew, marbled godwit, black-bellied plover and the great blue heron. The primary food producing area for these species is intertidal flats with fine grained sand or silt/clay sized particles. The Bowerman Basin has been identified as a particularly significant site among the many important sites within the estuary and is perhaps of international significance. A more thorough discussion on the shorebird population can be found in appendix C.

(3). Fish-eating Waterbirds, Gulls and Terns. The deeper water areas of the estuary are utilized as feeding sites for sea birds including rhinoceros auklets, common murres, marbled murlets, pigeon guillemots and parasitic jaegars. Other waterbirds seen in the outer estuary and the deeper waters of both the North and South Channels include loons, grebes, shearwaters, petrels and cormorants. These species aggregate according to feeding preference. Some of the species (redneck grebe) feed in high salinity waters of the outer harbor while others (pied billed grebe and western grebe) feed in fresher water areas of the main channel of the Chehalis River and into the North Channel. Gulls and terns are abundant, and the estuary provides nesting space for unique colonies of mixed associations of gulls and Caspian Tern. The nesting colonies on Whitcomb Island, Sand Island, and Goose Island are very important especially to the Caspian Tern populations. The Whitcomb Island colony is the largest identified Caspian Tern colony on the West Coast.

(4). Terrestrial Birds. A large variety of terrestrial birds are found within the confines of Grays Harbor Estuary. These species have a direct relationship to the surrounding vegetation and are particularly abundant during the late spring and summer months. Crows, marsh wrens, robins, kingfishers, flickers, sparrows, red-winged blackbirds, American gold finch and band tailed pigeon are a few of the more abundant.

(5). Raptors. The estuary is important for raptorial birds which feed over the wetlands and waterways of the estuary. The marsh hawk and short-eared owl are common raptors in salt marsh areas. These birds feed on small mammals and birds that live and feed in the vegetation of the salt marshes. The great-horned owl, red tailed hawk, peregrine falcon, merlin, American kestrel, Cooper's hawk, sharp-shinned hawk and bald eagle are also seen. All of the species except the bald eagle are known to prey upon shorebirds and are most often seen during migration and wintering periods.

(6). Figure 17 identifies some of the significant avian habitats within the GHEMP area.

b. Mammals. The mammals of Grays Harbor Estuary are primarily associated with the intertidal waters and related wetlands. The most abundant mammal forms are marine mammals that live in the estuary and feed on the fish and shellfish in the bay. The harbor seal occurs in large numbers in the outer estuary and haul-out areas have been identified and mapped. The seal population has been estimated at 500 seals during winter with as many as 1,400 observed during summer. Marine mammals other than harbor seals make only occasional appearances in Grays Harbor. Stellar sea lions, harbor porpoises, and gray whales have been observed inside the estuary. A variety of small mammals (voles and shrews) are found in the salt marshes and furbearers (muskrat, red fox, raccoon, mink, weasels, river otter and beaver) are abundant in the riparian habitat associated with the estuary. Black-tailed deer, Roosevelt elk, and black bear are generally peripheral to the estuary but use the shoreline, higher salt marshes and tidelands for occasional feeding.[3]

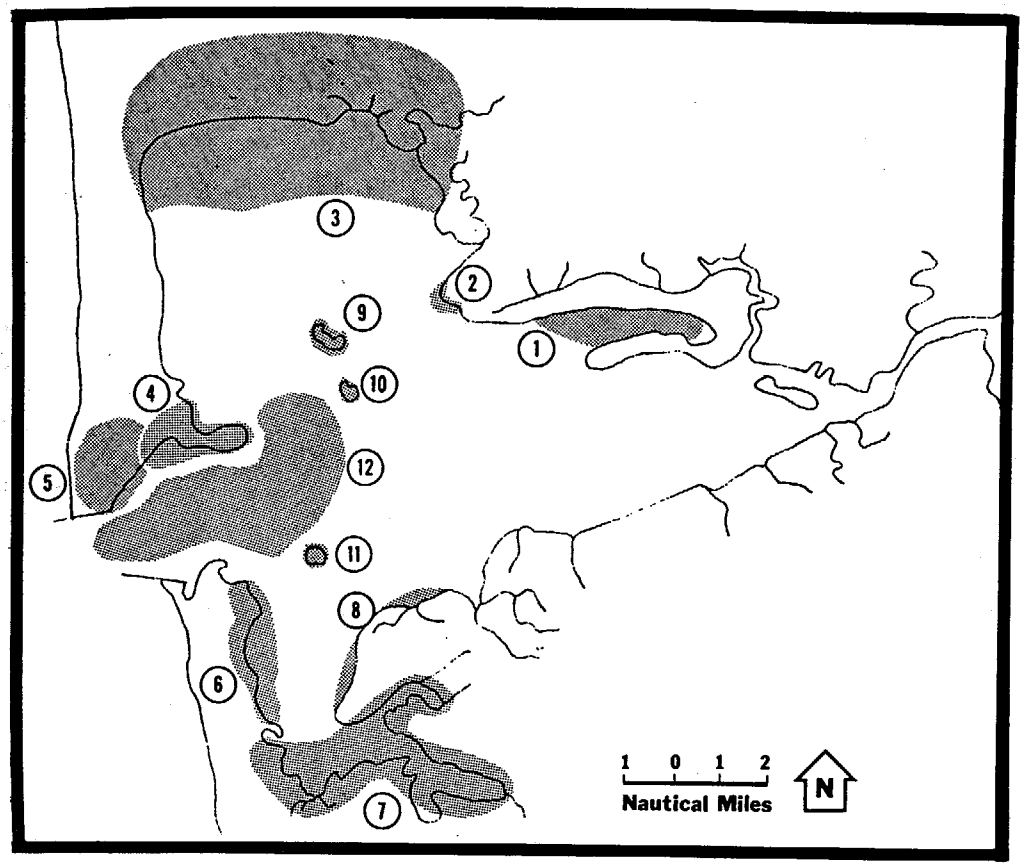
4. Fish (see attach. 1, map 9 - Fisheries)

a. Anadromous fishes. Anadromous fishes in Grays Harbor include spring and fall chinook salmon (predominantly fall chinook), coho salmon, chum salmon, steelhead trout, searun cutthroat trout, Dolly Varden, shad and sturgeon.

(1). Distribution of the species is strongly influenced by bottom type, estuary depth, salinity, season, and food organism availability.[2] Map 9 identifies the major tributaries of importance within the study area. All anadromous species use the estuary as a migration route. Since the estuary is a trnsition zone between freshwater and saltwater, this is a zone of physiological adjustment important to survival. Some species such as fall chinook and chum salmon may spend a considerable amount of rearing time in the estuary; food availability is particularly important for these species. Figures 18 through 20 list the various migration times of the species. Figure 21 shows both the outmigration times and relative abundance of four of the species.

FIGURE 17

Significant Bird Habitats



Source: Sharpe, G.W. Interpretive History of Grays Harbor 1977

1. North Moon Island Tideflats * Prime feeding area, largest concentrations of dunlin, western sandpiper, and other shorebirds. Largest wintering grounds of dunlin on the west coast. Shorebirds are also found on all tidelands composed of very fine sediments, notably North Bay, South Bay, and portions of the inner harbor. Peregrine falcon, marsh hawk, and short-eared owl feeding area.
2. Point New - Coarse sand and gravel beach utilized by black brant for gravelling, along with ruddy turnstone. Also resting area for shorebirds. Peregrine falcon and marsh hawk feeding area.
3. North Bay and Humptulips River - Raptor habitat and shorebird resting area. Bald eagle wintering area. Peregrine falcon and marsh hawk feeding area. Largest concentrations of waterfowl.
4. Point Damon - Snowy plover nesting area, unique to Grays Harbor (four pair in 1975). Shorebird resting area. Raptor habitat, peregrine falcon, marsh hawk and snowy owl feeding habitat.
5. Oyehut Wildlife Recreation Area--Shorebird resting area. Raptor habitat, peregrine falcon, and marsh hawk feeding area. Snowy owl feeding range.
6. Grass Island and Westport - Shorebird resting area and raptor habitat. Short-eared owl and snowy owl feeding areas. Waterfowl feeding areas.
7. South Bay and Elk River - Shorebird resting and waterfowl feeding areas. Short-eared owl and marsh hawk feeding areas.
8. Redmans Slough at Ocosta - Heavy concentrations of spring migratory shorebirds. Also shorebird resting area. Marsh hawk feeding area.
9. Goose Island - Largest known western gull colony on outer coast of Oregon and Washington; shorebird resting and waterfowl resting area.
10. Sand Island - Western gull colony (800 pair) and Caspian tern colony (700 pair) shorebird and waterfowl resting area.
11. Whitcomb Island - Largest caspian tern colony in Washington (1075 pair in 1975, now 1200 pair). Shorebird and waterfowl resting area.
12. Outer-Harbor Seabird Feeding Area - Common murres and young moulting rhinocerous auklets are found here.

* aka Bowerman Basin

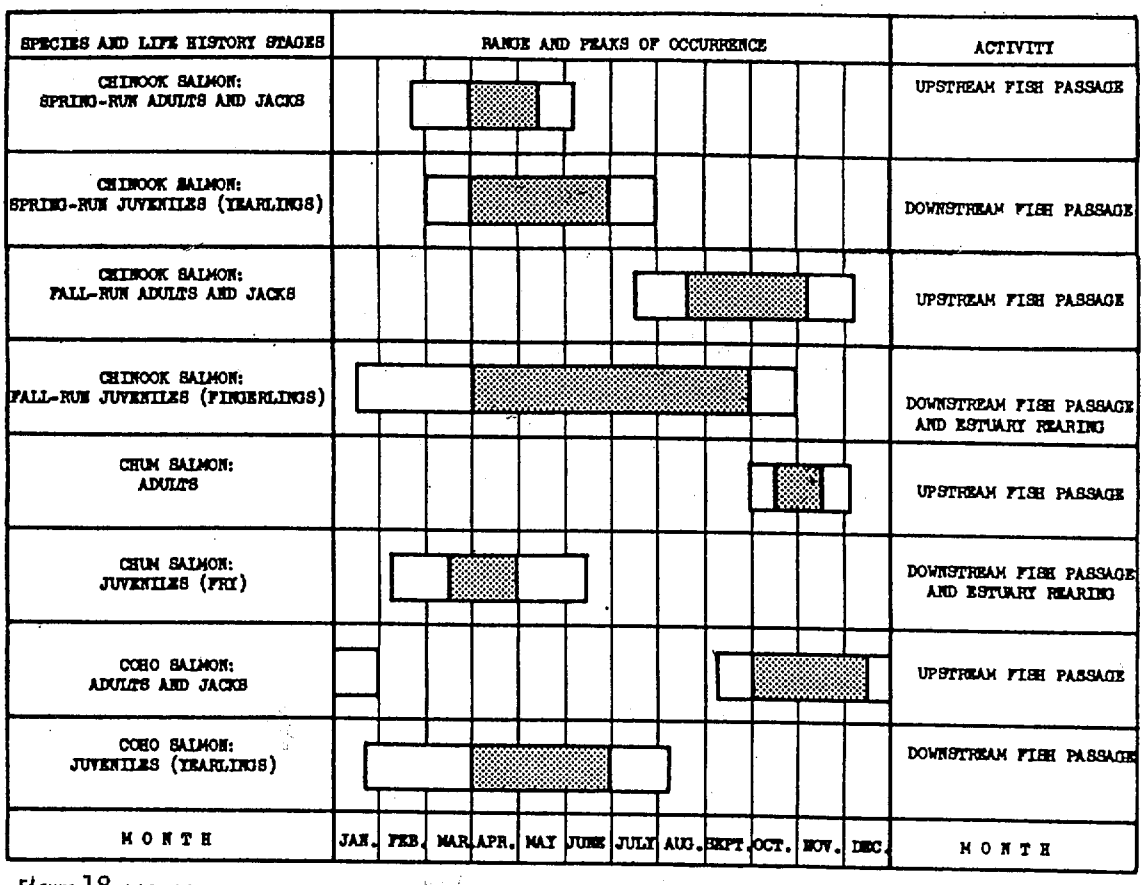


Figure 18. Life history stages and range and peaks of occurrence of chinook, chum and coho salmon in Grays Harbor, (Deschamps, 1970).

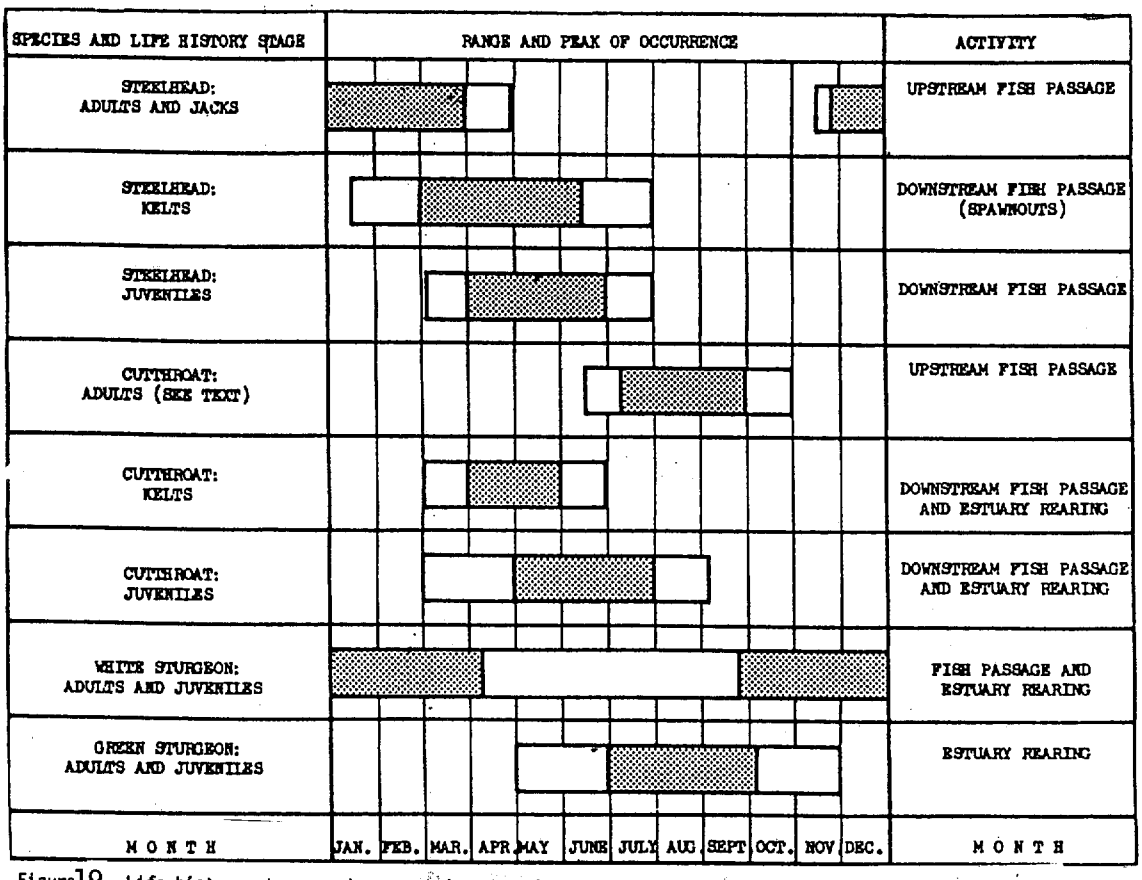


Figure 19. Life history stages and range and peaks of occurrence of steelhead, cutthroat and sturgeon in Grays Harbor.

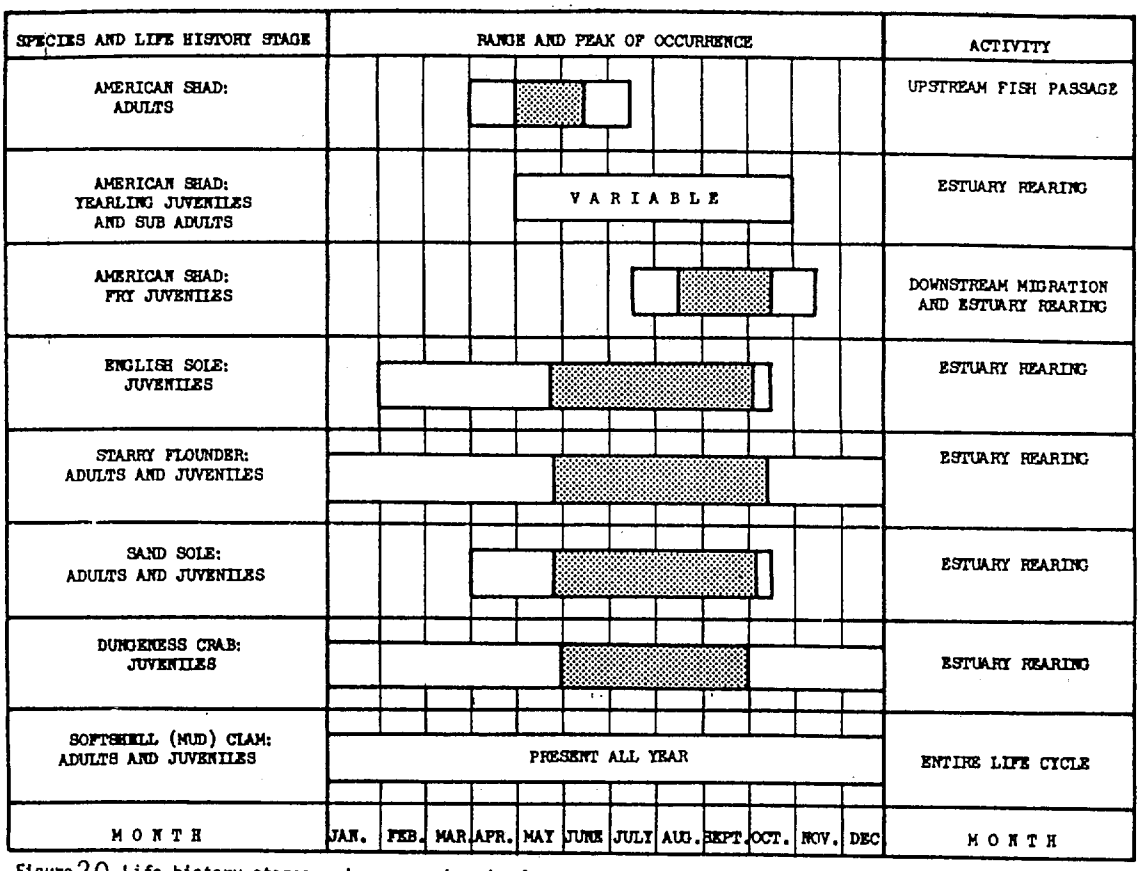


Figure 20. Life history stages and range and peak of occurrence of shad, flounder and shellfish in Grays Harbor.

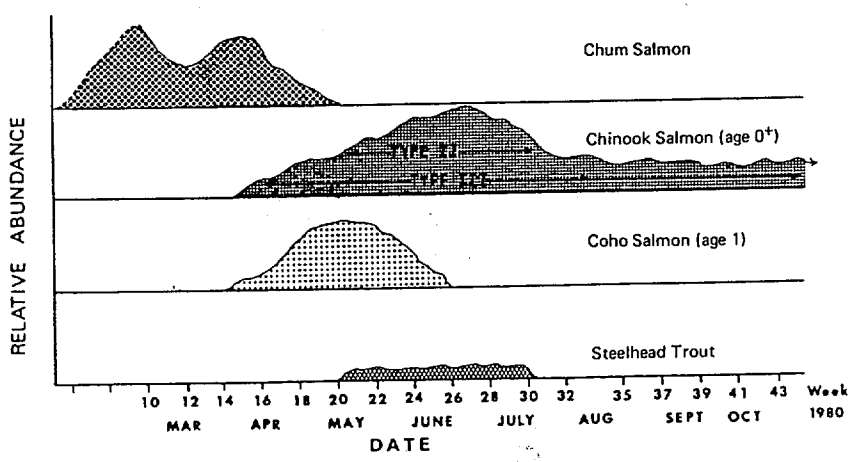


Figure 21. Outmigration periods of chum, chinook and coho salmon, and steelhead trout in Grays Harbor, Washington, March - October 1980((from Siminstad 1981).

Type II - migrates out of Grays Harbor
Type III - portion of the population that remains within the estuary through October

(2). The salmon runs require areas sheltered from predators for rearing, resting and feeding during passage, and food produced by the natural aquatic environment. The essential aspects of the aquatic environment consist of three types of areas.

(a). Areas below tidal influences; the fish passage and the most essential part of the fish habitat.

(b). Intertidal areas; areas between low and high tide. These areas are highly productive of marine organisms, especially the benthic fauna which are the base of the food web. These areas also afford juvenile fish food and shelter at higher tides.

(c). Marsh area; these areas are populated by aquatic grasses and related plants and are a source of insect larvae which are food for fishes.

While all aquatic/wetland areas are important, some of these areas have been considered particularly significant by resource personnel who participated in the planning process. Areas which are considered particularly important include:

(d). The shallow areas on the Hoquiam waterfront where juvenile salmon and other fish have the opportunity to rest and feed during their passage up the Chehalis estuary to spawn.

(e). The Hoquiam Fish Base. Of the shallow areas for fish feeding and passage, the old "Hoquiam Fish Base" is considered particularly important.

(f). The South Side Marsh. A remaining stretch of marsh on the south side of the Chehalis River provides essential nutrients for this stretch of the estuary and is considered to be needed to maintain the productive base of this part of the ecological system. Shallows near this marsh also give opportunities for fish resting and feeding.

(g). The riparian marsh vegetation and related shallow areas on the Chehalis River. Riparian vegetation is defined as plants found adjacent to and dependent on river water for growth and development. As the river narrows through Junction City and Cosmopolis, the shallow areas and the riparian marsh fringe on the east bank become particularly important to support the fish passage.

(3). Shad is an introduced species brought from the Atlantic Coast in the late 1800's. Two species of sturgeon are found in Grays Harbor: the green sturgeon (Acipenser medirostris) and the white sturgeon (A. transmoutanus). The white sturgeon is more abundant in the upper estuary and lower Chehalis River and the green sturgeon dominates in the lower estuary and more marine waters.

b. Marine and Estuarine Fishes.

(1). Flat Fishes. The most abundant flat fishes in Grays Harbor are the starry flounder, juvenile sand sole and English sole and a variety of small flat fishes such as sand dabs. The broad mudflat areas in the lower and mid-portions provide extensive feeding and rearing grounds for the juveniles of commercially important flat fishes, such as the English sole. Flat fishes also feed upon insect larvae produced in marshes adjacent to tideflats. However, English sole and starry flounder are present in all areas of the estuary.[2] Some portion of the population of these two species rear in the estuary.

(2). Marine sport fish. "Surf Perches," ling cod, rockfish and greenling are resident in the lower estuary throughout the year and are associated with marine structures such as rock jetties and pilings.

(3). Smelt and Herring. Smelt and herring-like fishes occur in lower Grays Harbor throughout the year. "Anchovies" feed in the lower bay and are an important part of the tuna bait-seine fishery. "Herring" are known to spawn in the lower harbor during the winter and early spring months in areas of rocks, pilings, and aquatic vegetation.

5. Invertebrates

a. Shellfish.

(1). Oysters. Pacific oysters (*Crassostrea gigas*) are cultivated in outer Grays Harbor, principally near Whitcomb Flats, and in North and South Bays.[2] They require a very high level of water quality, feeding primarily on plankton in the water.

(2). Clams. Both hard-shell and soft-shell clams occur in Grays Harbor, although gravelly habitat for hard-shelled clams is limited. Hard-shell clams are comprised of cockles, Washington butter clams and little-neck clams. Soft-shelled clams (*Mya arenaris*) are commonly called mud clams. Other small clams found in the bay contribute significantly as food for waterfowl.

(3). Crabs. Dungeness crab (*Cancer magister*) forms an important part of the commercial shellfish landings in Grays Harbor. The crabs utilize the estuary mainly as a rearing area and are generally found in the channels and sink holes but move on to the tidal flats to feed at high tide. Juvenile crabs feed and rear throughout the bay at all seasons of the year.

(4). Shrimp. Ghost shrimp (*Callianassa californiensis*) is a tube-dwelling shrimp that burrows in the sand, is used for bait and causes losses to the oyster industry because they destroy the firmer substrate needed by the oysters. Other shrimp include mud shrimp, Gray shrimp and various species of free-swimming shrimp.

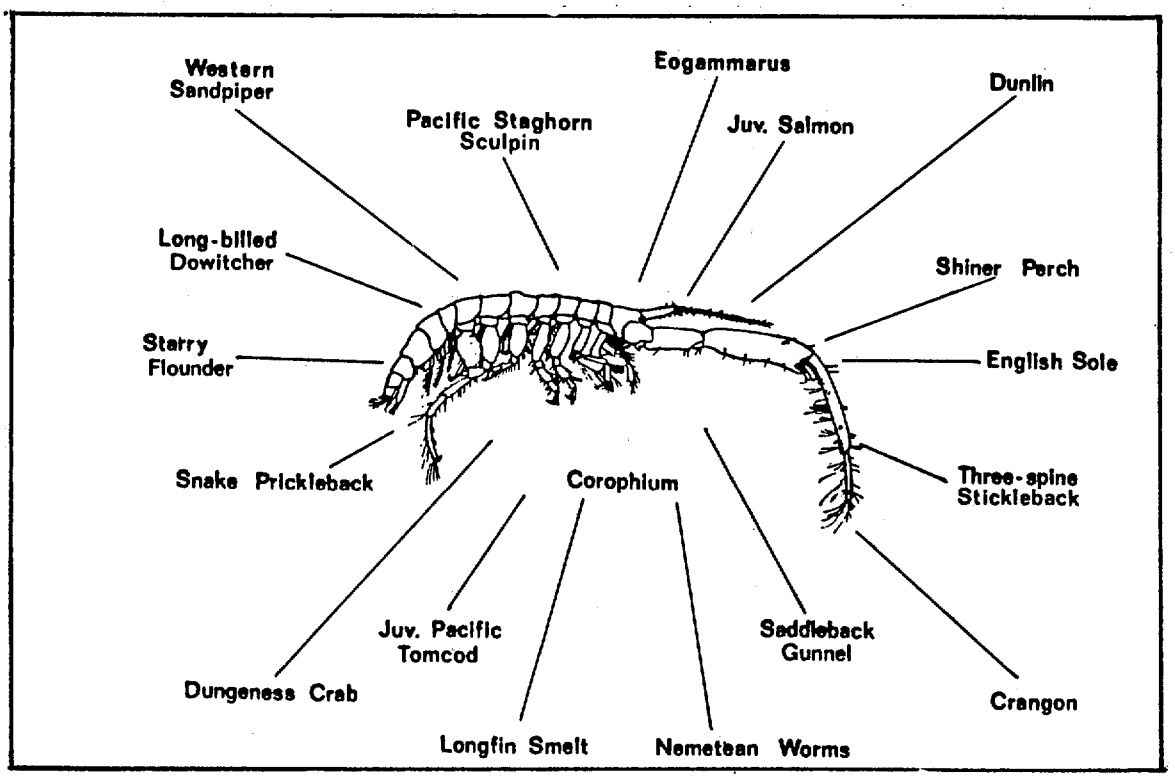
b. Benthic Invertebrates. The broad tidal flats produce a great abundance of small bottom dwelling organisms which are not commercially important but are very significant to estuarine ecology as a basic food source to higher organisms in the food web and are also of scientific and educational value. It is these organisms that provide a basic link between the plant and organic matter transmitted to the bay from the marshes and rivers.

(1). The three most frequently encountered amphipods in Grays Harbor are Corophium salmonis, Anisogammarus confervicolous, and an Eohaustorious species. C. salmonis appears to be the most numerous benthic macro-organism found in the inner harbor and midharbor flats and intertidal areas and is a major prey species for numerous organisms (see figure 22). The role of C. salmonis vis-a-vis shorebirds is more thoroughly described in appendix C.

(2). A. confervicolous is important in the high intertidal areas of the inner harbor, and Eohaustorious is the most numerous in the outer harbor. A cumacean, Leptochelia savignyei, appears to be the numerically dominant organism in parts of the outer harbor. Another cumacean, a Diastylis species, is found at Whitcomb Flats and is the most numerous organism in both the North and South Channels. Capitellid polychaete worms (Heteromastus filiformis) are also present through the harbor as is the annelid worm (Manayunkia aestuarina) (from studies conducted by Albright and Bouthillette, 1982).[2,11]

(3). Regarding intertidal invertebrates, some generalities as stated by Albright and Bouthillette (1982) include: species diversity increased with decreasing elevation, from the inner to the outer harbor; general abundance of invertebrates was highest in summer and lowest in spring; when epifauna are excluded, invertebrate biomass was highest in spring and lowest in summer; annelid worms were the most important group, by number, at every site studied. Generalities including subtidal invertebrates include: diversity increases from east to west; diversity is lowest in spring and highest in autumn; and, total biomass is highest in winter and lowest in summer.

FIGURE 22



Source: Albright and Armstrong (1982)

6. Threatened and Endangered Species

a. Flora. No threatened or endangered species of plants are known to occur in the Grays Harbor study area.

b. Marine Animals.

(1). Of the eight marine animals which are found in the eastern North Pacific Ocean at some time in the year, and are listed as endangered, only the gray whale (Eschrichtius robustus) has been known to stray into the inner areas of Grays Harbor during northbound or southbound migration periods.[2]

(2). All marine mammals are protected under the Marine Mammal Protection Act of 1972 (P.L. 92-522). Harbor seals (Phoca vitulina richardi) are the most common and utilize the outer harbor islands and flats. Other marine mammals known to make at least occasional excursions into the estuary are the Steller sea lion (Eumetopias jubatus), porpoises and dolphins.[2]

c. Avian Fauna.

(1). American Peregrine Falcon. The recorded sitings of the American peregrine falcon (Falco peregrinus anatum) are sufficiently complete to confirm the presence of the endangered species in the Grays Harbor area (see appendix C). Previous sitings were generally thought to be the Peale's variety (F. p. pealei) which generally inhabits coastal areas. Areas in which falcons (without respect to subspecies) have been sited include:

- Oyehut Wildlife Recreation area,
- Point Damon,
- North Bay and the Humptulips River Delta,
- Point New,
- Bowerman Basin (most abundant sitings),
- Rennie Island
- South Bay and Elk River.

In addition, Dr. Steven G. Herman, a noted bird expert who has studied shorebirds and falcons in the Grays Harbor area for an extended period of time, has stated that his observations strongly suggest that arctic peregrines (F. p. tundrius) may also migrate in small numbers through Grays Harbor during spring migration of the shorebirds.[10] No specific identification has been made to date however. Because anatum has been specifically identified hunting upon the large shorebird populations in the Bowerman Basin which was designated for development, OCRM has conducted Section 7 (Endangered Species Act) consultation with the U.S. Fish and Wildlife Service (see appendix C).

(2). Bald Eagle. The norther race of the bald eagle (Haliaeetus leucocephalus alascanus) is regularly sited in Grays Harbor. They have been sited preying upon waterfowl and shorebirds but normally feed upon salmon and fish species.

(3). Brown Pelican. Palecanus occidentalis has been sited at the mouth of Grays Harbor. Grays Harbor is near the northern range limit of the brown pelican.

(4). Snowy Plover (Charadrius alexandrius nivosus). The snowy plover is a candidate species to be added to the Endangered Species List. There are only a few nesting pairs which have been observed on Damon Point.

d. Other Species of Concern.

(1). Caspian Tern. Whitcomb Island contains the largest identified colony of Caspian Terns on the west coast.

(2). Great Blue Heron.

(3). Brant.

(4). Olumpic Mudminnow.

(5). Black Stickleback.

(6). Short-tailed Weasel.

SOURCES: Sections C & D

1. Vincent, Mary K., Habitat Development Field Investigations, Rennie Island Marsh Development Site Grays Harbor, WA, Corps of Engineers, 1978.

2. Corps of Engineers, Seattle District, Grays Harbor, Chehalis and Hoquiam Rivers, Washington - Channel Improvements for Navigation, "Interim Feasibility Report and Final Environmental Impact Statement," 1982.

3. Montaigne-Bierly Associates, Grays Harbor Estuary Management Program, "Phase I Technical Memoranda," 1977.

4. Norman Associates, Grays Harbor Erosion Management Study, prepared for the Grays Harbor Regional Planning Commission, 1974.

5. Corps of Engineers, Seattle District, Long-Range Maintenance Dredging Program, FEISS No. 2, 1980.

6. Opdyke, Jeffrey D., Final Fish and Wildlife Coordination Act Report, "Grays Harbor, Chehalis and Hoquiam River, Washington," U.S. Fish and Wildlife Service, Sept. 1982.

7. Miller, G.H., Eelgrass Distribution, Density, Leaf Length and Standing Stock in Grays Harbor, Seattle District Corps of Engineers, DACW 67-77-M-1240, 1977.

8. Thom, Ronald M., Primary Productivity and Carbon Input to Grays Harbor Estuary, Washington, Prepared for Seattle District Corps of Engineers, 1981.

9. Smith, J.D. and D.R. Mudd, Grays Harbor Maintenance Dredging and the Environment, "Appendix H. Impacts of Dredging on the Aviana Fauna in Grays Harbor." Seattle District Corps of Engineers, 1976.

10. Herman, S.G. and J.B. Bulger, The Distribution and Abundance of Shorebirds During the 1981 Spring Migration at Grays Harbor, Washington, Prepared for Seattle District Corps of Engineers, 1981.

11. Albright, R., and P.K. Bouthilette, Benthic Invertebrate Studies in Grays Harbor, Washington, Prepared for Seattle District Corps of Engineers, 1982.

E. Socioeconomic Environment

1. Grays Harbor has a natural resource economy based on harvest, manufacture and/or export of products derived from natural production. Forestry, commercial fishing, tourism, and agriculture comprise the economic base of the region. Because of seasonal employment characteristics in these economic sectors, the area has chronically high levels of unemployment, significantly higher than State and national averages.

2. The Hoquiam, Aberdeen, and Cosmopolis areas in the upper bay comprise the major urban and industrial locations in the study area. Timber and timber products processing and shipping facilities are located in this region of the bay. Grays Harbor is a major shipping port for timber products to national and international markets. In 1980, 498.2 million board feet (Scribner Scale) of logs were exported.[1] Grays Harbor is Washington's only Pacific Coast deep water port. In 1982 approximately 2.4 million tons of imports and exports of water borne foreign and domestic commerce occurred in the harbor.[2] The estuary has had an authorized and maintained navigation channel since 1906, and has historically been a major shipping port for forest products. The currently proposed deepening of the 30 foot channel to Cosmopolis to a depth of 38 feet will require an initial disposal of approximately 19 million cubic yards of material and an annual maintenance dredging of 2.8 million cubic yards. The proposed new channel will accommodate the larger and deeper draft vessels being used in the international market place. The GHEMP calls for the preparation of a Dredged Material Disposal Plan to be compatible with the approved plan.

3. Westport is the commercial and sport fishing center of the Grays Harbor area, and because of its proximity to the deep draft navigation channel it has potential to expand into deep draft activities. Ocean Shores is a tourism, retirement, and suburban area.

4. Grays Harbor County had a 1980 population of 66,314 (U.S. Bureau of the Census). This is estimated to have declined to 66,100 in April 1982 (Office of Financial Management, State of Washington). The population of Grays Harbor County declined from 1930 to 1940, then rose slowly to the 1980 level with 1980 being the first year to exceed the 1930 population. The county population increased by 11.4% in the 1970's. While the forest industry has fluctuated with national and international markets, the tourism industry has generally expanded. The population of Westport and Ocean Shores went from about 300 in 1930 to 3,908 in 1982. While growth in the urban areas of Aberdeen, Hoquiam, and Cosmopolis increased after World War II, this area has declined in population by almost 18% from 1930 to 1982.

5. Although less densely populated areas such as Grays Harbor have become increasingly attractive to urbanites seeking homes with more open space, the area's lack of job opportunities has been a major contributor to its lack of population growth.

6. Five incorporated communities are located around Grays Harbor. (see table 6).

TABLE 6

POPULATIONS BORDERING GRAYS HARBOR: 1982

Grays Harbor County	Aberdeen	Hoquiam	Cosmopolis	Westport	Ocean Shores
66,100*	18,550	9,490	1,570	1,990	1,918

Source: Washington State Office of Financial Management.

*This figure is a total Grays Harbor County population figure and not the unincorporated population which abuts the estuary. The population of the unincorporated areas which borders the estuary is about 4,000, the largest portion being in the Central Park area.

Each of the incorporated communities is expected to have a modest growth rate during the next decade (see table 7).

TABLE 7

POPULATION PROJECTIONS: 1990

Grays Harbor County	Aberdeen	Hoquiam	Cosmopolis	Westport	Ocean Shores
72,865	19,520	11,039	2,052	2,485	2,969

Source: Grays Harbor Regional Planning Commission.

7. The dominant land use in Grays Harbor is forestry (see attach. 1, map 1, Existing Land Use). Over 90 percent of the county is timberland.[3] Agriculture and pasture lands make up approximately three percent of the county's land.[4] The remainder is utilized for industrial, commercial, residential, and recreational uses.

8. Approximately 1,070,000 acres (87.5%) of Grays Harbor County was classified as forest land capable of producing 20 cubic feet per acre per year of industrial wood and available for timber production in 1980.[3] The National Forest comprises 34% of the public timberland (12% of the total timberland) and 78% of the private ownership is controlled by the forest industry (about 50% of the total timberland) (see table 8). Nearly all this land is under some form of management program. In the estuary area, timber use may extend to the shoreline as on the south shore. Timber interests also own about 62 percent of the front footage along the water within the Aberdeen-Hoquiam-Cosmopolis area, using this footage for mill sites and for shipping facilities (see Attach. I, Map 2, Land Ownership).

TABLE 8
TIMBERLAND OWNERSHIP

PUBLIC		PRIVATE	
Ownership Class	Thousand Acres	Ownership Class	Thousand Acres
National Forest	131	Forestry Industry*	533
Indian	127	Farmer	14
Other Federal	1	Miscellaneous	139
State	76		
County and Municipal	50		
TOTAL	385		686

Source: Timber Resource Statistics for the Olympic Peninsula.[3]
*Major corporate owners include ITT-Rayonier, Weyerhaeuser, Boise-Cascade, Simpson Lumber Company, and Mayr Brothers.

9. Forest products constitute one of the major industries in the State of Washington. This industry produces lumber and wood products, and paper and allied products. The forest products industry has historically been the major source of employment in Grays Harbor County. In 1975, 83% of all manufacturing jobs and over 28% of the total employment were in these employment sectors.[5] In 1981, 83% of all manufacturing jobs and approximately 23% of the total employment were in these sectors.[5] This later figure reflects an increase in total employment caused by the Satsop Nuclear Power Project and its large temporary construction work force in Eastern Grays Harbor County and a general recession in the timber industry.

10. The historical dependence upon the forest industry has also produced fluctuating employment levels with unemployment rates generally exceeding State and national rates. During the first six months of 1982, the unemployment rate in Grays Harbor was 16.4% compared to the State rate of 12.4% (see table 9).[6] Approximately 41% of the total persons receiving unemployment benefits in Grays Harbor County were in the logging, lumber, pulp, and paper sectors.[7] To combat this heavy dependence on these employment sectors, the need for diversification of the economic base of Grays Harbor was identified as early as 1961 and has been a priority goal in every Overall Annual Economic Development Program since that time.[8]

TABLE 9

AVERAGE ANNUAL UNEMPLOYMENT
GRAYS HARBOR COUNTY, WASHINGTON STATE, NATION
1972-1982

YEAR	Grays Harbor County Number of Unemployed	Grays Harbor County Percent Unemployed	Percent of State Labor Force Unemployed	Percent of National Labor Force Unemployed
1972	2,370	9.4	9.5	5.6
1973	2,320	8.9	7.9	4.9
1974	2,413	9.3	7.1	5.6
1975	3,156	12.4	9.6	8.5
1976	2,107	8.0	8.6	7.7
1977	2,656	9.6	8.8	7.0
1978	2,310	8.0	6.8	6.0
1979	2,770	8.7	6.8	5.8
1980	3,326	10.3	7.5	7.1
1981	4,709	13.9	9.2	7.6
9/1982	4,520	13.2	11.1	9.7

Source: Washington State Department of Employment Security and U.S. Department of Labor.

11. Commercial fishing is also a major contributor to the area's economy. Grays Harbor supports large populations of fish and wildlife which are the basis for the commercial fishery and a significant proportion of the tourism economic sector. Westport ranked among the top 40 ports in the country in

poundage and values of commercial fisheries products landed in the United States in 1981.[9] Approximately 16% of the gross tonnage of all commercial boats in Washington were Grays Harbor boats, and about 3.2% of the total State net fishery for 5 species of salmon were landed near Grays Harbor in 1981.[9] In 1982, preliminary figures indicate that approximately 52% of Washington's commercial troll salmon fish was caught in the ocean area near Grays Harbor.[10] Other than anadromous fish, landings in Grays Harbor include salmon eggs, shad, and sturgeon totaling about 36,000 lbs. in 1981.[9] Other major marine fish landings include sole, halibut, and cod. The major processing and landing facilities are at Westport. The major oyster processing plants are in South Bay, though oyster rearing occurs in both the South and North Bays. Approximately 73,000 gallons or 11% of the total oysters produced in Washington State were from the Grays Harbor area in 1981.[9] Other shell fish harvested include crab, shrimp, and clams (see Attach. I, Map 10, Natural Resource Use).

12. Tourism, Parks and Recreation.

a. Tourism is directly related to the esthetic characteristics of the ocean and to other regional attractions. Ocean marine angler trips (charter boats, salmon fishing) from Grays Harbor accounted for over 50% of the yearly Washington State total in 1982[10] and represent an influx of about $9 million to the local economy in direct revenues.[11] Waterfowl hunting is concentrated in the North Bay, South Bay and Chehalis River areas, and fishing for salmon and other species in the streams tributary to the estuary represents a significant portion of the total tourist dollar flow. The estuary is also extensively used for non-consumptive wildlife viewing, especially bird watching, due to the excellent opportunity available to observe a wide variety of birds. This viewing has been estimated, by fish and game biologists, to equal the hunting activity (in total man-days) in the bay (see figure 23 for sites).

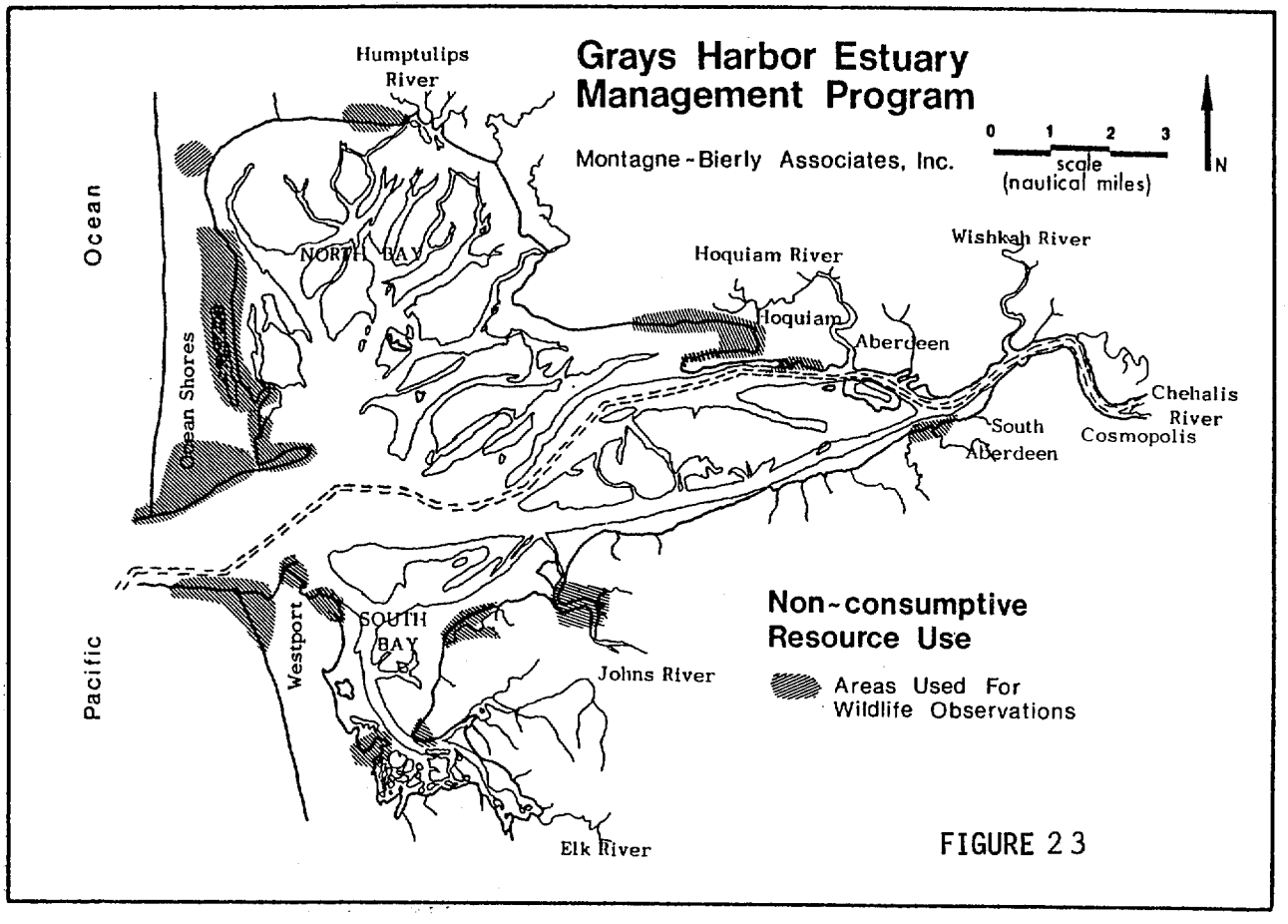


FIGURE 23

b. The major public recreation facilities in the study area itself include the Westport and Ocean Shores Marinas, several public boat ramps, and over 3,000 acres of managed wildlife areas. Significant State parks are found along the ocean beaches where demand for such facilities is considerably higher than in the estuary itself. There are two water oriented lake parks which provide a full range of water recreation near the estuary at Lake Aberdeen (a city park) and Lake Sylvia (a State park). The GHEMP contemplates the development of a waterfront park in Aberdeen.

c. The estuary and surroundings have significant aesthetic values which are detailed in An Interpretive Survey of the Grays Harbor Area.

13. Agriculture also contributes to the regional economic base. The two most significant agricultural producers are the cranberry bogs near Grayland and North Bay and dairy farming. The Pacific Northwest's only cranberry processing plant is located at Ocosta in the southwest part of the Central Bay area. County land utilized for agriculture totaled approximately 50,000 acres in 1978.[4] Agricultural uses within the estuary study area are limited to about 92 acres of cranberry bogs on the North Bay, approximately 900 acres of farmland west of Montesano, and about 100 acres of pasture in the Ocosta area. Due to favorable soil conditions, most of the county's farmland extends east and south from Montesano.

14. The future of Grays Harbor will depend upon maintenance of employment levels in these four major industries. Expansion in any one area will be bounded somewhat by serious environmental considerations, but a balance must be sought between economic growth in these four sectors and environmental management and protection of the estuary as an essentially fragile resource. Future land use decisions in the area will inevitably be tied to this need for balance. Both economic improvement and environmental protection can and must be pursued simultaneously as twin land use goals of paramount importance to Grays Harbor.

15. The impacts, use, and development in and adjacent to the estuary are controlled by a complex set of laws and regulations (see Attach. I, Map 3, Jurisdiction and Boundaries). Local jurisdictions regulate land uses through planning and zoning ordinances. The State of Washington Shoreline Management Act, State Environmental Protection Act, and other State laws regulate land use, natural resource management, harvest, and environmental quality. Federal resource protection, management and environmental laws regulate shoreland and waterway alteration. The coordination of these three levels of government control (State, local, and Federal) toward commonly agreed-upon goals is the major objective of the GHEMP.

16. Transportation and Utilities. (See attach. 1, maps 4 & 5)

a. Air. The estuary is currently served by three public airports, two of which are located in the study area. Two of the public airports, Westport and Ocean Shores, are inadequate to serve the communities, especially for their tourism role. The Bowerman Airfield serves as the regional airport.

b. Rail. The area is served by two rail lines which generally abut the shoreline of the estuary for extensive distances, and for large distances in the lesser developed area the lines form artificial barriers between the aquatic and upland environments. Therefore, the rail lines are generally used as the study boundary lines for the plan.

c. Road. Traffic circulation through Aberdeen-Hoquiam is currently a problem with minimal separation of industrial, local and through traffic on the congested urban arterials. Both Ocean Shores and Westport generate high volumes of weekend and summer tourist traffic with a high portion of the traffic consisting of slow moving recreational vehicles and trailers. Port industrial areas generate large volumes of log truck traffic as do the commercial centers.

d. Utilities. There is sufficient water, sewer and energy capacity to service anticipated future growth in the Aberdeen-Hoquiam-Cosmopolis area.

SOURCES: Section E

1. U.S.D.A., Ruderman, Florence K. "Production, Prices, Employment, and Trade in Northwest Forest Industries, Fourth Quarter, 1981." May 1982.

2. Port of Grays Harbor, "Annual Report-1981."

3. U.S.D.A., Bassett, P.M. and Oswald, D.D. "Timber Resource Statistics for the Olympia Peninsula, Washington, "Resource Bulletin PNW-43," November 1981.

4. U.S. Department of Commerce, Bureau of the Census, "1978 Census of Agriculture, Vol. 1 State and County Data, Port 47 Washington," AC78-A-47.

5. Washington State Employment Security Dept., Nonagriculture Wage & Salary Workers, by place of work.

6. Washington State Employment Security Department, Resident Civilian Labor Force and Employment, by Place of Residence.

7. Washington State Employment Security Department, Insured Unemployed by Standard Industrial Sector by Job Service Center.

8. Grays Harbor Regional Planning Commission, "Overall Economic Development Program for Grays Harbor County, Washington," Aberdeen, WA, June 1979.

9. Washington Department of Fisheries, "1981 Fisheries Statistical Report," Olympia, WA.

10. Washington State Department of Fisheries, "Washington Ocean Salmon Catch Summaries," 12/19/82, Preliminary.

11. Washington State Research Council, "The Washington State Visitor Industry: Economic Impacts and Data Base Development," May 1982, and Grays Harbor Regional Planning Commission, "Grays Harbor Tourism Plan," March 1983

PART IV: ENVIRONMENTAL CONSEQUENCES

PART IV: ENVIRONMENTAL CONSEQUENCES

A. INTRODUCTION

1. This part discusses and analyzes impacts expected to occur to the Grays Harbor environment due to plan implementation and impacts associated with alternatives. Even though this is a program EIS which addresses impacts on a generic scale, it also attempts to be specific in some areas where those impacts can reasonably be expected to occur. Further specific impacts (i.e., air and water quality) associated with a specific use or activity can only be analyzed on a case-by-case basis and will have to await review at the point of permit application. Because of the commitment to utilize the plan by the various regulatory and resource agencies, it is important to have an overall understanding of the potential impacts which will be associated with the fulfillment of the MU designations, whether or not they occur in reality.

2. There are two assumptions made in this analysis of impacts. First, the impacts are considered within the framework of a comprehensive plan for the estuary in which the concept of a balance was considered to include tradeoff between resource use and protection. Second, GHEMP does more than just modify existing local SMP's as described earlier in this statement (Part I); nevertheless, land and water use activities are currently taking place which may be similar in nature to those envisioned by the plan because they are consistent and permitted by existing local SMP's. Thus some impacts would be expected to occur to estuarine resources irrespective of plan implementation. Therefore, the major focus of concern deals with MU 12 - the Bowerman Basin - and the impacts associated with future port expansion in an estuarine area which has been identified as significant to migratory shorebirds and peregrine falcons.

3. Perhaps the major caveat which should be remembered is that the "plan is designed to provide guidance to the decisionmaking process, it does not make decisions itself" (GHEMP, p.6). In short, what one reads or envisions may not be what actually takes place since that will be a function of future requests for development. To the extent that activities are consistent with the plan, this EIS should be useful in the assessment of those activities.

B. ELEMENTS OF THE PHYSICAL ENVIRONMENT

.. Earth

a. Geology, Soils and Topography. If implemented, the plan would allow some alterations of the shoreline and wetlands through fill while limiting fill in other sections especially in existing urban areas. Some areas, notably a section of the Bowerman Basin, would be raised and leveled from existing contours. Topography would change at Westport Marina and Airport, Ocean Shores Marina and Airport, and proposed industrial sites at MU's 12, 14, 15, 16, 17, 18, 25, and 26. Marine structures and works permitted in the plan may also alter the geomorphic processes of erosion and sedimentation by altering the local hydraulics of the system. From a geologic perspective, these influences are expected to be minor. The plan protects soils which are conducive to agricultural practices in North Bay (MU 8) and the Chehalis River (MU 22). Dredge spoil displaces bottom sediments as new soil for purposes of fill or marsh habitat creation.

b. Unique Physical Features. The Bowerman Peninsula is a unique man-made physical feature. The western toe of the peninsula would be extended westward under the first phase of development (Area 2) and northward under the second phase of development (Area 3). Minor alterations to Rennie Island (MU 43) will continue through the additions of dredged materials disposal for a short term. Few, if any, alterations are permitted to occur in MU's 2, 3, 29, 34, 41, and 42.

c. Erosion. Erosion and siltation from upland sources are not addressed in the plan. Shoreline erosion mitigation to both man-made and natural features through both physical and natural means can be expected to be minimized through the policy on Bankline Erosion Control. The plan specifically limits areas in which erosion control measures can be taken and only under specific criteria and standards applied in the policy (GHEMP, p. 24). Some form of bankline erosion control would be permitted in the following MU's:

	Permitted	Conditional	Special
UD -	11, 14, 15, 18,	26, 28	25
UM -	4, 16, 17, 39	37, 38	6, 33, 35
UR -	21		5
RL -	9, 10, 23, 27	30, 32, 36	
RA -	22	31	8
CM -	1, 40	26, 43	3, 24, 28, 33, 35
CN -			30, 38
SP -			12, 19

Each MU was reviewed for it assets, purpose for erosion control and potential adverse impacts. Given the conditions put into the policy, it is believed the environmental consequences of the implementation of the policy for permitted activities will be minimal both individually and cumulatively to the natural environment and is designed mainly to protect public works (e.g., roads and bridges), private property and natural resources. Implementation of the policy in other areas may be deemed potentially significant and activities are therefore considered as conditional or special uses requiring extra review for impacts (e.g., see MU's 5 and 6 which allow erosion control measures only out to the waterward limit of residential lots). The effect of the plan's implementation will be to reduce shoreline erosion, including the reduction of suspended particles and toxic materials from runoff; remove debris and solid waste build-up; and in some cases lead to revegetation of the bankline. Adverse impacts could include the modification of fish and shorebird habitat, although implementation of the policy would ensure minimal adverse effects. Major erosion impacts, however, occur outside the plan area in the upper reaches of the watershed. Since the estuary is mainly an accreting area, it is not expected that there will be many erosion stabilization projects proposed outside of the urban environments or the entrance of the harbor based upon past experience for permit requests. (COE, personal communication, 1982).

d. Accretion/Avulsion. Marine structures and works can be expected to create minor modifications to the hyraulic regime through accretion (build-up) or avulsion (wearing away). The major areas which might have such impacts are located in the upper estuary (MU's 15, 16, 17, 18, 25, and 26) and near the mouth of the estuary (MU's 1 and 40).

2. Air

a. Air Quality. Although the plan does not specifically address air quality concerns, effects of two types might be projected if the plan were implemented.

(1). Since the plan provides increased areas for industrial uses near Bowerman Field, on South Shore and other areas, such uses could result in increased pollutants both by direct emissions (industrial sites) and by increased traffic generation (including boats). The population is expected to grow as a result of economic development envisioned by the plan. Since direct emissions are rigidly controlled by the Olympic Air Pollution Authority, these impacts are not expected to be major or exceed safe levels. The Grays Harbor airshed does not currently have major air quality problems. The nature of any direct or indirect emissions would vary substantially by the specific type of use which would be developed in these areas. Air quality impacts from specific uses (such as those which might locate in MU 12, the Bowerman Basin) will be reviewed on a case-by-case basis. Since all other areas designated as Urban are committed to such uses already, the plan represents almost no other impact on air quality in these areas. Improved airport facilities can be expected to induce greater utilization at Ocean Shores and Westport, thereby increasing the levels of airplane emissions entering the surrounding estuary.

(2). Since the Rural, Conservancy and Natural designations would prohibit intensive use and tend to conserve vegetation, conservation of such areas as envisioned in the plan would tend to be beneficial to air quality and its shorelines.

b. Odor. The impact of the plan on odor is largely similar to that of air quality, with actual impacts dependent upon the types of uses which would be developed.

3. Water

a. Surface Water Movement. Since the plan permits some modification of aquatic areas, the plan would affect localized water movement. The most apparent way is by the displacement of water or intertidal area with upland wherever filling may be permitted, or by inhibiting tidal flushing. Such areas would be limited to:

(1) Moon Island Tideflats and Bowerman Basin (MU 12). This area is flushed daily. Filling would not alter the predominant east-west tidal flow. Filling will provide a more sheltered area from wave attack with potentially less sediment stirring (Dave Schuldt, Seattle Corps of Engineers, personal communication 3/83).

(2) Port Slip (MU 15).

(3) Westport Basin (MU's 38 & 39).

(4) Aberdeen Park (MU 17).

(5) Wherever bankline straightening is applied.

(6) Wherever bankline erosion control is developed.

(7) Wherever activities may require some filling or diking.

(8) Harbor entrance and navigation channel.

These actions when taken either individually or cumulatively should not significantly alter estuarine circulation nor flushing. Channel improvements which have the greatest potential for altering surface water movements are neither permitted or prohibited by the plan (in MU 44) and are considered through existing procedures. The hydraulic alterations associated with the potential widening and deepening of the navigation channel are discussed in the Channel Improvements FEIS (Corps, 1982).

b. Runoff/Absorption. Since the use designations of the plan are largely similar to existing patterns, the effect of the plan on runoff and absorption would be relatively minor. The most significant effects would occur in the utilization of Areas 2, 3 and 5 of MU 12 by various uses, and the infilling of vacant areas within designated Urban areas. Other significant areas would include the South Shore (MU 26) and Cosmopolis (MU 25). Naturally, the plan itself will not create growth but would allow it occur. The specific effect of future uses will depend on the particular design of such developments and would be evaluated during project submissions.

c. Floods. While filling would reduce the natural capacity of the estuary to absorb flood waters, the amount of fill which would be permitted by this plan, coupled with the locations and configurations, would produce an imperceptible effect. No development is planned in any area designated as a floodway but some development in the Rural and Urban MU's would be located in the 100-year floodplain. The plan states that the South Aberdeen flood control project, which has been previously evaluated by the Corps of Engineers, is consistent with the plan (GHEMP, p. 80). This would reduce flood hazards in South Aberdeen and Cosmopolis.

d. Surface Water Quantity. Implementation of the plan would reduce the tidal prism of the estuary wherever filling would be permitted. Such reduction, however, is limited by the plan to approximately 600 acres of the remaining 54,720-acre water surface at high tide (approximately 1.1 percent).

e. Surface Water Quality. While implementation of the plan would tend to conserve water quality by protecting undeveloped areas of the bay from significant encroachment, the specific relationship of the plan to the water quality warrants specific analysis.

(1). Impact of actions.

(a). Bowerman Industrial Complex. The filling of Area 2 and 3 should have a short term adverse effect during construction on the water quality of the surrounding area of the estuary due to the regulation of disposal methods and the fact that the dredged material disposal would be confined behind dikes. The most adverse impacts would be associated with any dike failure (should that occur) during filling operations. Potential effects are temporary increases in turbidities, nutrient levels, toxic substance levels and decreases in dissolved oxygen and acidity (pH). State and Federal agencies monitor such filling to ensure compliance with water quality standards. Factors that influence the impact of filling are river flow, time of year, type of fill, method of fill, amount of fill and location of fill. Before the project

is started, all primary and secondary factors will be addressed to reduce the overall impact. Industrial development of these sites would lead to increased sewerage loads, both directly and indirectly. Since no new point discharge is expected, these loads would need to be accommodated in the municipal systems. The Hoquiam System has been reconstructed, and it is anticipated that capacity would be sufficient to accommodate future demands. Of potential concern will be the non-point discharges including storm water runoff which may discharge into the Bowerman Basin or into the navigation channel which may eventually mix with tidal flows into the Basin. The degree of impact will depend on the type of uses to occupy the land and specific measures taken to minimize non-point discharges.

(b). Modification of Port Slip. The modification of Port Slip No. 1 includes filling (20 acres) and redevelopment of the area. A temporary increase of suspended particles and a decrease in dissolved oxygen in the fish passage could result from the project. The Corps of Engineers has evaluated this proposed use of the site for dredged material disposal in relato the proposed channel improvements and determined that impacts of disposing of dredged material (some polluted) behind containments structures would not have significant adverse impacts and mitigation would not be required. (COE, Channel Improvements FEIS, 1982).

(c). Marinas. The plan contemplates the future expansion of the Westport and Ocean Shores Marinas and the construction of the Aberdeen Park Marina. Marinas generally degrade water quality because they inhibit complete tidal flushing creating a decrease in dissolved oxygen levels, increases in toxic substances (oil based products) and flotsam. MU 4 permits only continued operation of maintenance of the existing outfall and no new outfall. MU 38 would permit marina expansion from MU 39 if better flushing would occur (GHEMP, p. 99). The GHEMP clearly demonstrates a sensitivity to water quality and marina maintenance and expansion.

(d). Airports. Airport runways and particulates from aircraft exhaust may increase non-point sources of pollution through runoff into the surrounding aquatic areas.

(e). Bankline Straightening. During construction, temporary water quality problems may occur similar to other fill situations (i.e., increase in turbidity levels, reduced light penetration, addition of pollutants, increase in oxygen demand). Bankline straightening is permitted only in MU's 15, 16, and 17 and under special conditions in MU's 12, 18 and 25. This is in the already highly modified environment and in State Class B waters. The actions are limited to 2 acres in size which individually or cumulatively should not significantly impact water quality. Water quality to protect the fish migrations is important in this area.

(f). Bankline Erosion. The Bankline Erosion policy is designed to reduce erosion and stabilize banklines. Some of the effects of reduced erosion are reduced suspended particles and toxic materials from runoff, and the removal of debris and solid waste build up. The long-term effect is expected to be a minor improvement in water quality (since this is a function of how many individuals or applicants utilize this provision of the plan).

(h). Structures. Temporary reduction in water quality will result during construction of structures. Minor fills, use of heavy equipment, and realignment of the shoreline will increase suspended particles, and reduce dissolved oxygen levels. After the construction is complete, water quality will return to near normal conditions.

(i). Mineral Extraction. No significant water quality problems are expected to take place as a result of aggregate mineral extraction. Exiting operations in MU 22 are monitored by State agencies to ensure suitable water conditions. New mineral extractions will be required to submit plans to State agencies. MU 44 policy states that aggregate extraction is conditionally permitted if water quality standards can be met, there are no adverse impacts on fish habitat or seasonal fish runs, and there are no alternative sources in the general urbanized inner harbor.

(2). Management Categories

(a). Urban. Urban Management categories (i.e., UD, UM and UR) contribute most of the pollutants entering the estuary. Heavy industry, municipal uses, non-point out-flows and ground seepage are major ways pollution enters the estuary (in addition to siltation). Plans have been implemented by local municipalities to meet water quality standards set by the Federal and State governments to improve the water conditions. Municipalities and private corporattions have made significant improvements to reduce point source effluents entering the estuary. The Cities of Hoquiam, Aberdeen and Cosmopolis have completed development of separated sewage and storm drainage systems. Westport has developed a new sewer plant with an adequate capacity to handle future growth and additional fish processing plants. Ocean Shores is planning to expand its sewer system to reduce sewage outflows. At the present time it is impossible to determine the total effect or when some proposals are going to be implemented, but a general improvement in water quality is expected to occur. The major impact that the estuary plan has on these conditions is to specify limits to urbanization around the harbor.

(b). Rural. The designation of rural categories (i.e., RL and RA) is not expected to affect water quality in the estuary. The type of pollutants entering the estuary will be leachates, fertilizers, surface runoff and erosion. The plan does not significantly alter existing conditions or problems but does reduce potential problems by restricting urban encroachments into these areas.

(c). Conservancy. Conservancy categories (i.e., CM, CN and N) aid the natural biological water quality cleaning process. The conservancy categories are designed to preserve much of the natural habitat, microorganisms and aquatic vegetation that aid in improving water quality. Further water quality concerns in the estuary and the tributary basin are specifically addressed in the Regional Water Quality Management Plan - Basin 22, and the actions envisioned in this estuary plan are largely consistent with that plan. This Water Quality Management Plan is the basis of the State's 208 planning in this basin.

f. Ground Water Movement and Quality. The affect of the actions and policies envisioned in the plan on ground water movement and quality would be relatively minor.

h. Public Water Supplies. The impact of this plan on public water supplies would be to increase their use. The levels of development contemplated in the plan can be supported by either existing or planned facilities. In the case of industrial and port development aspects of the plan such development is needed to utilize the existing industrial water system which is underutilized at this time.

C. ELEMENTS OF THE BIOLOGICAL ENVIRONMENT

1. General

a. Future impacts associated with activities which may be consistent with the plan can be separated into two categories: first, impacts associated with dredged material disposal, filling and placement of structures; and second, land use activities which utilize the fill sites or structures. The major impacts of concern in the GHEMP will be due to the discharge of dredged and fill material in selected sites, behind confined dikes, to be used, when filled, for some form of land use activity (i.e., port, industry, transportation, etc.).

b. The potential and actual impacts associated with dredged material disposal on aquatic habitats in Grays Harbor have been studied and discussed at length by previous investigators.[1] The most significant adverse impact includes the direct loss of habitat through covering (or removal) which destroys vegetation, smothers immobile organisms and forces mobile forms to migrate, alters substrate or destroys access to important feeding, nursery and resting areas temporarily (if subsurface disposal) or permanently (if uplands are created) leading to mortality or community disruption. With respect to the fringe areas of confined fill sites, the bulk and composition of the fill material and the location, method and timing of discharge may all influence the degree of impacts on the substrate. Other factors such as changes in normal water conditions (clarity, chemical content, nutrient balance, D.O., pH, temperature, salinity, current patterns, circulation and fluctuation) near the impacted site may also have direct or secondary effects on habitats increasing stress placed on the ecosystem or sub-element of the ecosystem.

c. While Grays Harbor has a choice diversity of habitats, some appear to be more critical than others based upon biological productivity and utilization. It is important to protect the water and vegetative habitats in order to ensure there is no decline in the total diversity of the faunal and vegetative species which inhabit the estuary or utilize it during migration periods even though there may be a decline in abundance of organisms utilizing parts of the estuary due to partial loss of habitat.

d. GHEMP would allow, subject to further permit review when required, a number of projects which will produce local significant adverse environmental impacts. The plan also guarantees positive environmental impacts, which are discussed generally. Vast areas of relatively undeveloped shoreline, estuarine waters and habitat are protected from development either through MU designations, conditions placed upon activities (including mitigation and enhancement requirements) within those MU's, and transfer of potentially developable and environmentally sensitive land and water areas to the public domain. All users of the estuary will benefit from an approved plan which provides substantially better guidance for development by incorporating many requirements of Federal, State and local governments.

---

1. A complete listing of pertinent references is available through the Seattle District of the U.S. Army Corps of Engineers.

2. Vegetation and Habitats

a. The impact of the plan on flora resources of the estuary is similar in nature to several other relationships: a significant impact will occur in areas designated for urban uses and on shorelines where modifications are planned or permitted; this is balanced by a conservation and protection of resources in areas designated for lower intensity uses.

b. Table 10 summarizes the potential loss of aquatic areas which would be impacted by future projects. These are also the areas in which fish and wildlife resources will be impacted, with some impacts extending beyond the impacted vegetation zone (i.e., the fringe or edge zone).

TABLE 10

Project	Habitat Affected	Approx. Acres Filled*
Bowerman Complex (MU 12)	Tidal Mudflats	up to 350
	Eelgrass beds	up to 100
	Low silty marsh**	30
Hoquiam Fill (MU 14-Area 7)	Low silty marsh	20
Ocean Shores Airport (MU 4)	Freshwater marsh	10
	High immature marsh	30
Westport Marina (MU 39)	Low sandy marsh	48
Westport Airport (MU 38)	High mature marsh	15-18
Aberdeen Marina (MU 17)	Intertidal	1.3
	Sedge marsh	1
Port Slip #1 (MU 15)	Intertidal/Subtidal	20
South Shore Site (MU 26)	Freshwater marsh	98

* These are estimates. Final determinations must be made at the time of permit submission by the applicants.

** The low silty marsh north of the Bowerman Peninsula would be reestablished, and additional marsh would be established along the north side of Area 2. This would be at the expense of some intertidal mudflat habitat. So there may be a net increase in low silty marsh in MU 12.

c. Site specific impact analyses related to the Ocean Shores Airport and Port Slip #1 have been previously reviewed through the NEPA process.[1] The impacts associated with the Aberdeen Marina (Morrison Riverfront Park) have recently been reviewed under the SEPA process.[2] The Seattle District of the COE is in the process of preparing a site specific DEIS on the South Shore Site to be used as a maintenance dredging material disposal site by the Port of Grays Harbor. The types of vegetation located at the various sites in table 10 have been previously described (see Smith, Mudd & Messmer, 1976, Maintenance Dredging and Environment of Grays Harbor, Appendix F: Vegetation).

d. Adverse impacts associated with the loss of this vegetation and habitat include the reduction of primary productivity, food supply, rearing and resting areas; decrease in the capacity to reduce erosion, sedimentation and absorption of pollutants; and impact nutrient cycles (e.g., the sulfur or carbon cycles).

(1). Loss of eelgrass beds and salt marsh represents the greatest loss in organic production. The loss of salt marsh vegetation may be offset somewhat by the establishment or reestablishment of salt marsh habitat in the estuary (through enhancement or in-kind mitigation). Some of the more productive marsh areas in Grays Harbor are former dredge disposal sites. These areas revegetate naturally and point to the probability of successful marsh establishment. (COE, 1980, Long-Range Maintenance Dredging Program FEISS No.2) The wetlands surrounding the estuary, however, do not provide the greatest amount of carbon which is used by the neritic and epibenthic zooplankton. Grays Harbor receives high inputs (ca 900 x 10^6 kg C/yr) of both particulate and dissolved organic carbon through the six major rivers and small tributaries which enter it (R. Thom, U.S. Army Corps of Engineers, Unpublished). The most important sources of the Grays Harbor epibenthic and neritic zooplankton production are allochthonous (from outside the estuary) detrital material (or carbon sources) eelgrass and epiphytic algae (Simenstad and Eggers, 1981).

(2). Vegetation associated with tidal mudflats include primarily algal mats, diatoms and organic detritus (decaying vegetation) which are important to benthic invertebrates and subsequently the rest of the food web.

(3). The relationship between vegetation and estuarine productivity can perhaps best be illustrated by the schematic diagram shown below in figure 24.

e. In addition to the acreage shown in table 10, the GHEMP allows modification of several hundred acres of privately owned lowland forest and freshwater marshes in MU's 18 and 25 under appropriate permits. This same development is allowed currently under the no action alternative. Figure 25 and table 11 show the vegetation types in MU's 18 and 25 which would be affected by urban use. Attachment 1, map 8, shows the extent of lowland (freshwater swamps) forests and freshwater marshes in the Chehalis River study area which includes MU's 18 and 25. The GHEMP would protect the majority (acreage unknown)

---

1. Ocean Shores Airport is discussed in FAA, Ocean Shores Airport, FEIS: Port Slip #1 is discussed in COE, Channel Improvements FEIS, 1982.
2. City of Aberdeen, Morrison Riverfront Park, FEIS, 1983.
3. Nelson, W.H., S. Kalinowski & L. Lynam, 1980, Chehalis River Floodplain Land Cover Mapping Between Aberdeen and Montesano, Washington, prepared for U.S. Army Corps of Engineers.

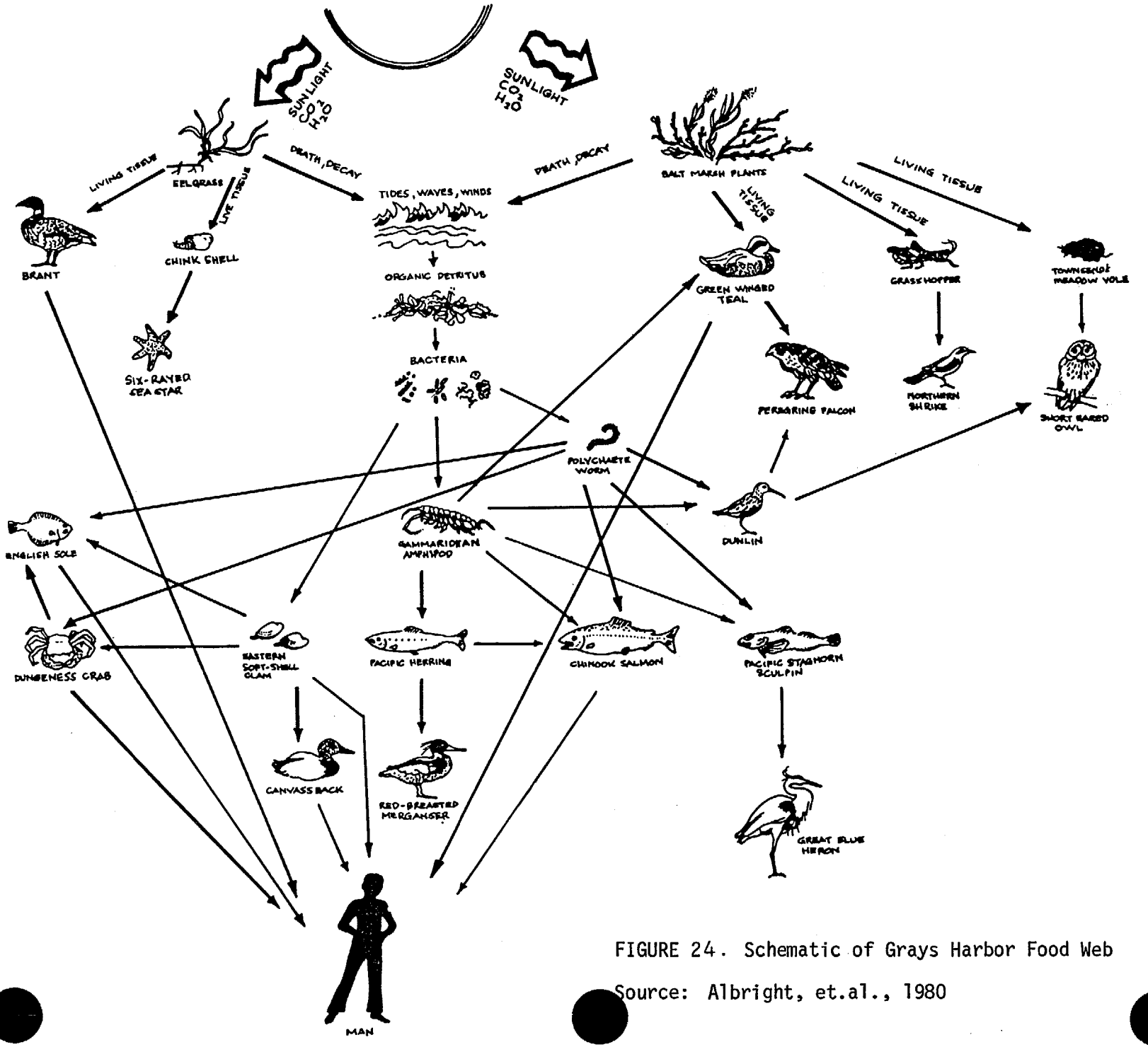


FIGURE 24. Schematic of Grays Harbor Food Web

Source: Albright, et.al., 1980

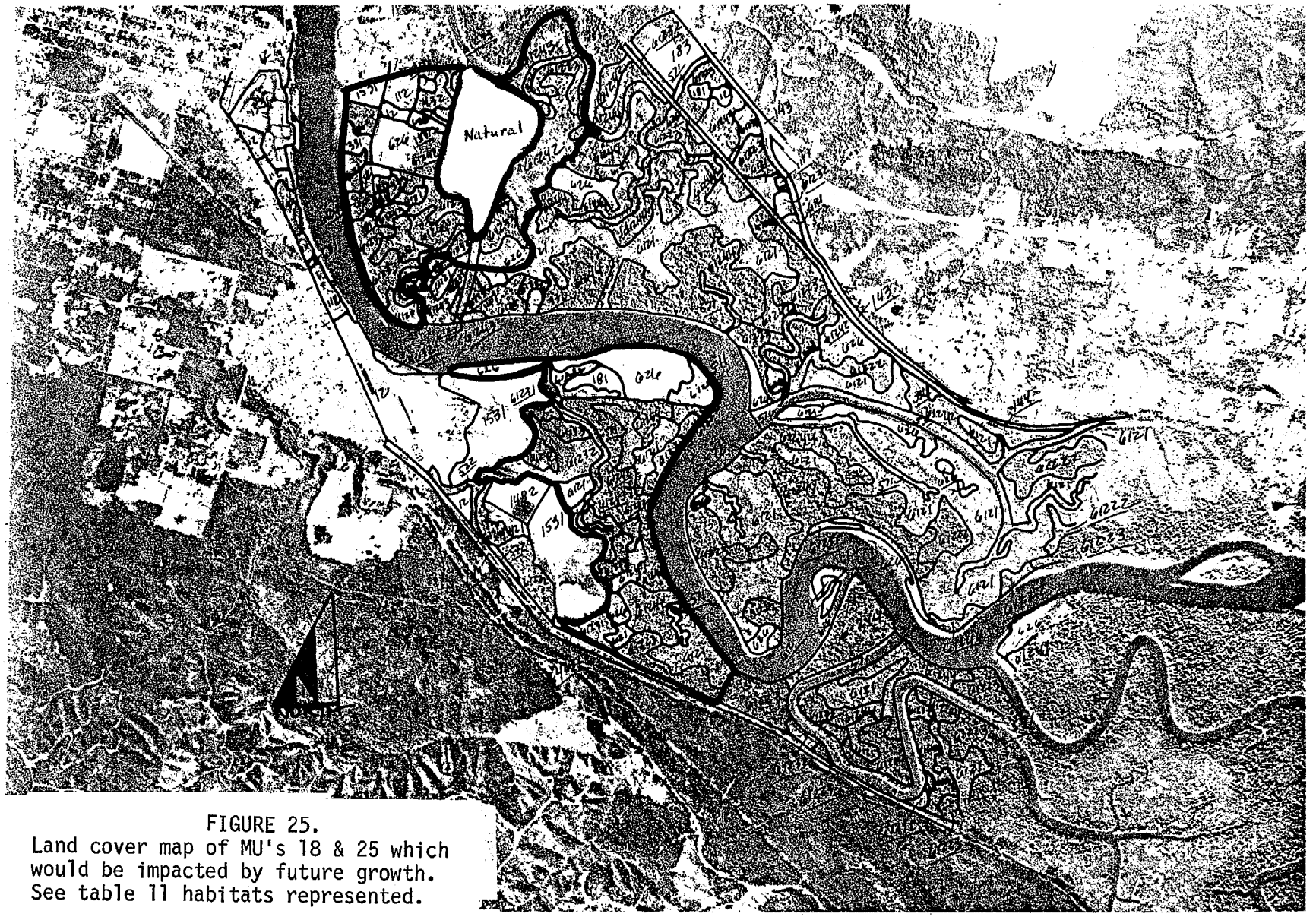


FIGURE 25.
Land cover map of MU's 18 & 25 which would be impacted by future growth. See table 11 habitats represented.

Source: Nelson, et.al., 1980

TABLE 11

Habitat Types in Figure

1. Urban
    - 11 Residential
        - 111 Nonwooded Residential
        - 112 High Density Residential
    - 12 Commercial/Service/Industrial
    - 14 Transportation/Utilities
        - 143 Highway
        - 144 Railroad
        - 146 Bridge
    - 15 Harbor/Port
        - 1531 Log Storage Yard
    - 18 Open Lands
        - 183 Refuse Station
    - 19 Recreational
        - 193 Urban Wooded

3. Nonforested, Vegetated Uplands
    - 332 Riparian Grass

4. Forested Uplands
    - 43 Mixed Forest
        - 431 Regeneration Mixed
        - 434 Second Growth Mixed
    - 46 Forested Riparian
        - 4622 Immature Broadleaf
        - 4632 Immature Mixed

5. Water
    - 51 Rivers/Streams
        - 511 Estuarine
    - 57 Blind Channels
        - 571 Freshwater Blind Channel

6. Aquatic Lands
    - 61 Aquatic Land - Forested
        - 612 Freshwater Swamp
            - 6121 Shrub Swamp
            - 6121/147 Shrub Swamp/Powerline
                - 61223 Second Growth Conifer Swamp
                - 61231 Regeneration Broadleaf Swamp
                - 61232 Immature Broadleaf Swamp
                - 61233 Mature Broadleaf Swamp
                - 61241 Regeneration Mixed Swamp
                - 61242 Pole Stage Mixed Swamp
                - 61243 Second Growth Mixed Swamp
                - 61244 Mature Mixed Swamp
    - 62 Aquatic Lands - Vegetated Nonforested
        - 626 Freshwater Marsh

of these types of habitat from major development in MU's 19, 20 and 24. The potential impact areas (freshwater swamps and freshwater marshes) which are outlined in figure 22 are adjacent to existing industrial land uses near Junction City and Cosmopolis.

(1). Excluding urban and agricultural habitats, the Chehalis River management area is predominantly forested swamp (4822 acres).[3] These lands are either covered by water or strongly influenced by adjacent waters. Urban development in MU's 18 and 19 would constitute the loss of approximately 300 acres.

(2). The Chehalis River Basin also contains approximately 244 acres of freshwater marshes.[1] MU's 18 and 25 contain approximately half of the freshwater marshes in the basin. Herbacious vegetation is dominant. Common types include sedges, grasses, rushes, cattails, reed canary grass, and bull-rushes. One of the most valuable functions of the marshes is their ability to moderate extreme highs and lows in streamflows. Overall, there are approximately 500 acres of freshwater marsh habitat remaining within the boundaries of the GHEMP. With full implementation of the plan (as well as under the no action alternative), approximately 2/5ths of that particular habitat could be altered or destroyed having potentially significant adverse impacts to flora and fauna species utilizing that habitat.

f. Estuarine Policies and Activities.

(1). Bankline Straightening will alter or destroy natural vegetation and animal communities in areas where permitted. The major areas where the policy applies are along the Hoquiam-Aberdeen waterfront (i.e., MU's 15, 16, 17 and under special conditions in MU's 12, 18 and 25). This type of vegetation varies from low silty marsh types to fresh water marsh types. Total impact of each application of this policy cannot exceed 2 acres. In most areas where this policy might be applied, existing vegetation has already been significantly affected by man's activities. Natural processes may re-establish vegetation on the face of the fill after construction activities, depending on the materials used for the fill. The policy states (GHEMP, p. 25) that two or more fills permitted under the policy may not occur at the same or a portion of the same site and that use of vegetation for bankline stabilization is required where technically applicable. These and other limitations apply in addition to normal requirements for a Section 404 permit. Impacts associated with implementation of this policy for may be significant locally but were considered acceptable on an estuary-wide basis given the resource protection provisions of the plan.

(2). Bankline Erosion policy is more stringent than existing policy and will therefore produce less adverse impacts. The intent of the policy is not to destroy existing vegetation which normally acts to buffer wave attack and erosion processes. In addition, the policy encourages the use of vegetation for providing bankline stability. The individual and cumulative impacts associated with implementation are not expected to be significant. The Task Force considered the Grays Harbor environment in determining where the activity is permitted vs. conditionally permitted.

---

1. Nelson, W. H. et. al., 1980, op. cit.
2. COE, Long-Range Maintenance Dredging Program, FEIS, 1980.

(3). Structures. As new or redeveloped structures are completed, some modification of flora will take place. Structures such as piers, docks and wharfs will reduce light that supports vegetation. In delineating the structural activities which might have adverse effects on the environment, the Task Force was careful in their choice of which activities should be considered permitted in the various MU's vs. those which need to be conditioned and subject to further review for impact assessment.

(4). Channel. New channel access and channel realignment have the most significant potential of impacting vegetation, particularly eelgrass beds. Dredging activities to maintain channels generally have little impact on the algae, eelgrass, and marsh communities in Grays Harbor.[2] The greatest potential impacts would occur in MU's 4 and 39.

g. Agricultural Crops. The plan would have no adverse impacts on agricultural crops including subsistence and local market farming activities, tree farming and cultivated crops which are allowed in the Rural and some Conservancy MU's.

h. The overall assessment on the plan's impacts to the vegetation of Grays Harbor is that the changes and refinements made in the MU designations, designation of permitted activities and conditions placed upon different types of activities within specific areas will provide greater environmental protection over the long term to the vegetation and habitat types identified than the no action alternative.

3. Faunal Resources

a. The impact of the plan on faunal resources of the estuary is closely correlated with the impact of the plan on flora resources and habitat types. Out of necessity, the plan is intended to address those activities which are destructive (e.g., discharges of dredged or fill materials within containment structures) of existing habitats. Some activities will be less destructive than others. In areas where development is permitted or where shoreline and aquatic areas may be modified, the local impact on fauna may be significant. There may continue to be some loss of habitat and decreases in the quantity of individual organisms utilizing the estuary. The net loss to certain species in particular (e.g., those which favor marsh vs. intertidal habitat) may be minimized by mitigation measures but some loss to other species is often associated with implementation of such mitigation.

b. Benthic Invertebrate Communities. Recent studies in Grays Harbor have focused on the impact of dredging operations on infauna (Albright and Bouthillette, 1982), epibenthos (Albright and Bouthillette, 1982 & Cordell and Simenstad, 1981, Simenstad and Eggers, 1981, Armstrong et al., 1981) and Dungeness crab (Armstrong et al., 1981). Food habitat studies have shown the importance of benthic invertebrates such as Corophium sp. and Anisogammarus sp., polychaete worms and others to fish and shorebirds. Any projects or activities which impact littoral or sublittoral habitat will smother diverse communities of benthic invertebrates with recolonization likely at the fringes depending on tidal elevation and substrate. The major project contemplated in this estuary is the development of MU 12 (Area 2 and Area 4). Since land would be raised

above the high water line and utilized for industrial purposes, a permanent loss of substrate and habitat would result. The major species of concern in this section of the estuary is the amphipod Corophium salmonis which serves as a major prey for shorebirds and fish. A more lengthy discussion on this topic is presented in appendix C. Implementation of the plan in the rest of the estuary should not produce significant adverse impacts to the various forms of benthic and epibenthic invertebrates in the estuary.

c. Fish. Plan adoption would have several impacts on fishery resources. The plan will provide greater protection of the fish passage and fish base as has been previously discussed. While some impacts would continue to occur in the urban fish passage area as a result of permitted/conditional activities, the plan restricts the extent of encroachment into the passage area. On a long-term basis, this would prove beneficial to the migratory fishes which make passage up or down the Chehalis River, especially if water quality continues to improve as it has during the last decade.

(1). Recent studies assessing the impacts of dredging and disposal operations were conducted by Charles A. Simenstad and Douglas M. Eggers for the Corps of Engineers.[1] The impacts associated with the proposed channel widening and deepening have been discussed in the recent FEIS on that subject.[2] Habitat degradation is divided into the major categories of decreased water quality and loss of feeding and rearing habitat. The Corps concluded that filling Slip No. 1 would not constitute significant impact to fisheries habitat and is not considered sufficient to warrant habitat mitigation. Bankline straightening and bankline erosion would produce minor impacts to small segments of littoral and sublittoral habitat. Direct removal of shallow sublittoral habitat might have a long term effect on epibenthic feeding juvenile salmonids. According to Simenstad and Eggers, it would appear that maximum concentration of organisms such as harpacticoid copepods occur with +/- 1.0 meter of the MLLW tide level, although important prey taxa may occur in abundance at higher tidal heights. Thus, removal of shallow sand and mudflat habitat higher than -1.0 meter tide level would effectively remove that area from production of salmonid prey organisms. Simenstad and Eggers believe this could have the greatest impact on juvenile chum and small chinook salmon in Grays Harbor which tend to utilize epibenthic organisms to a greater extent than other salmonids and English sole may be more adversely impacted than the salmon.[3] Further, the plan provides riparian habitat protection along streams and sloughs used by the migratory fish where future projects and activities are anticipated.

(2). Other potential impacts include fishery habitat removal and degradation in MU 12 (Area 2). This area has been previously impacted. However, implementation of the Area 1 provisions in MU 12 should provide long-term protection to Moon Island Tideflats, west of the Bowerman Basin, a known major nursery habitat for English sole.[4]

d. Avian Fauna. There are many areas in and around the estuary which are important to shorebirds, waterfowl and terrestrial birds. The plan protects the majority of bird habitats as shown in table 12. However, there are two potentially sigificant impacts which can be anticipated. The potential impact on birds in MU 12 is discussed in appendix C. The other habitat most likely to be impacted is the freshwater marshes scattered around the estuary and in the Chehalis River Basin. Table 13 lists the birds which are commonly associated with freshwater swamps and marsh habitats. Like marine plant communities,

TABLE 12

	Area	Birds Present	Management Unit Designation	
			Water Portion	Landside
(1)	Bowerman Basin	dunlin (largest concentration) western sandpiper other shorebirds marsh hawk peregrine falcon (feeding ova) short-eared owl	12-N (Area 1)	11-UD 12-UD (Areas 2-7)
(2)	Point New	black brant ruddy turnstone peregrine falcon (feeding ova) marsh hawk (feeding ova)	44-CM	10-RL
(3)	North Bay and Humptulips River	raptors shorebirds Bald Eagle peregrine falcon (feeding ova) marsh hawk (feeding ova) waterfowl (largest concentration)	44-CM	7-CM 8-RA 9-RL/N
(4)	Point Damon	snowy plover (nesting area) shorebird nesting area raptor habitat peregrine falcon (feeding area) snowy owl (feeding area)	44-CM	3-CM bordered closely by 2-N 4-UM
(5)	Oyehut Wildlife Recreation Area	shorebird resting area raptor habitat peregrine falcon (feeding area) marsh hawk (feeding area) snowy owl (feeding range)	44-CM	2-N
(6)	Grass Island and Westport	shorebird resting area raptor habitat	44-CM	37-UM/CN 38-UM/CN 39-UM
(7)	South Bay and Elk River	shorebird resting area waterfowl feeding area short-eared owl (feeding area) marsh hawk (feeding area)	44-CM	34-CM/N 35-UM
(8)	Redmans Slough at Ocosta	spring migratory shorebirds (heavy concentration) shorebird (resting area) marsh hawk (feeding area)	44-CM	30-RL 31-RA 32-RL
(9)	Goose Island	western gull (largest colony on outer coast of Oregon and Washington) shorebird (resting area) waterfowl (resting area)	14-CM special	14-CM special
(10)	Sand Island	western gull colony (800 pair) caspian tern colony (700 pair) shorebird (resting area) waterfowl (resting area)	41-N	41-N
(11)	Whitcomb Island	caspian tern colony (1200 pair) shorebird and waterfowl resting area	42-CN	42-CN
(12)	Outer-Harbor Seabird Feeding Area	common murres rhinocerous auklets	44-CM	

freshwater marshes are naturally fertile systems. A large number of birds and wildlife species utilize the marshes. Some live almost exclusively in marshes, while other are dependent on marshes to varying degrees.[1] While substantial impacts would occur to freshwater marshes, the plan protects the remaining habitat. Any future amendments to the plan should carefully weigh the importance of the remaining freshwater marshes to the total ecosystem diversity of Grays Harbor.

TABLE 13

Birds Commonly Associated With Freshwater Shrub Swamp or Marsh Habitats

pied-billed grebe (*Podilymbus podiceps*)
great blue heron (*Ardea herodias*)
green heron (*Butorides virescens*)
green-winged teal (*Anas carolinensis*)
wood duck (*Aix sponsa*)
ring-necked duck (*Aythya collaris*)
hooded merganser (*Lophodytes cucullatus*)
sharp-shinned hawk (*Accipiter striatus*)
Cooper's hawk (*Accipiter cooperii*)
Virginia rail (*Rallus limicola*)
sora (*Porzana carolina*)
rufous hummingbird (*Selasphorus rufus*)
downy woodpecker (*Dendrocopos pubescens*)
willow flycatcher (*Empidonax traillii*)
tree swallow (*Iridoprocne bicolor*)
rough-winged swallow (*Stelgidopteryx ruficollis*)
barn swallow (*Hirundo rustica*)
Steller's jay (*Cyanocitta stelleri*)
common crow (*Corvus brachyrhynchos*)
black-capped chickadee (*Parus atricapillus*)
common bushtit (*Psaltriparus minimus*)
Bewick's wren (*Thryomanes bewickii*)
long-billed marsh wren (*Telmatodytes palustris*)
robin (*Turdus migratorius*)
Swainson's thrush (*Hylocichla ustulatus*)
ruby-crowned kinglet (*Regulus calendula*)
cedar waxwing (*Bombycilla cedrorum*)
Hutton's vireo (*Vireo huttoni*)
warbling vireo (*Vireo gilvus*)
yellow warbler (*Dendroica petechia*)
yellow-rumped warbler (*Dendroica coronata*)
MacGillivray's warbler (*Oporornis tolmiei*)
yellowthroat (*Geothylpis trichas*)
red-winged blackbird (*Agelaius phoeniceus*)
brown-headed cowbird (*Molothrus ater*)
black-headed grosbeak (*Pheucticus melanocephalus*)
Lincoln's sparrow (*Melospiza lincolnii*)
song sparrow (*Melospiza melodia*)

Source: Nelson, W.H., Kalinowski, S., & L. Lynam, Chehalis River Floodplain Land Cover Mapping Between Aberdeen and Montesan Washington, prepared for U.S. Army Corps of Engineers, January 1980

In addition, construction and use of the Ocean Shores Airport will not destroy significant shorebird habitat directly, but may provide additional stress to the birds which utilize the western section of North Bay due to takeoffs, landings and overflights.

e. Mammals. Table 14 identifies the mammals which may be impacted by various future activities permitted by the plan. The table shows that riparian areas-wooded swamp habitat have the greatest diversity of species. Most of this habitat is protected in the plan from extensive use and alterations. Most mammals are highly mobile and utilize a diversity of habitats. The smaller mammals (moles, voles and shrews) may be most adversely impacted due to loss of habitat which in turn can affect the abundance of other predators.

f. Endangered Species. Both the National Marine Fisheries Service (ltr. dtd. July 14, 1980 from Thomas E. Kruse, Acting Regional (Northwest) Director to Dr. Robert R. Kifer, OCRM) and the U.S. Fish & Wildlife Service (ltr. dtd. December 11, 1981, from Joseph R. Blum, Area Manager to Charles N. Ehler, OCRM) have provided OCRM with assessments which conclude that implementation of the GHEMP is not likely to jeopardize any known endangered or threatened species. Earlier drafts of GHEMP led to formal Section 7 consultation based on concern over the potential impacts to the American peregrine falcon (and other peregrine subspecies). The GHEMP was modified to protect the majority of the Bowerman Basin considered as significant shorebird habitat which provides the migratory falcons with an abundant prey base. Should a future determination be made by the F&WS based upon new information derived from monitoring fill and construction activities in MU 12, the F&WS may recommend reinitiation of formal Section 7 consultation. Reinitiation of Section 7 consultation is the responsibility of the action agency. For more information on Section 7 consultation see appendix C.

TABLE 14. Mammals Found in Six Grays Harbor Habitats. 1975

Species	Habitats					
	Subtidal	Intertidal Flats	Salt Marsh	Diked Salt Marsh	Riparian Area Wooded Swamp	Freshwater Marsh
Opossum (Didelephis marsupialis)				x	x	
Masked shrew (Sorex Cinereus)					x	
Dusky shrew (Sorex obscurus)					x	
Vagrant shrew (Sorex vagrans)			x	x	x	x
Trowbridge shrew (Sorex Trowbridgii)				x	x	
Water shrew (Sorex palustris)					x	
Marsh shrew (Sorex bendirii			x		x	x
Shrew-mole (Neurotrichus gibbsii)					x	
Townsend mole (Scapanus Townsendii)				x		
Coast mole (Scapanus orarius)						x
Snowshoe hare (Lepus americanus)					x	
Mountain Beaver (Aplodontia rufa)					x	
Townsend chipmunk (Eutamias townsendii)					x	
Douglas squirrel (Chickaree) (Tamiasciurus douglasii)					x	
Northern flying squirrel (Glaucomys sabrinus)					x	
Mazama pocket gopher (Thomomys mazama)				x	x	
Beaver (Castor canadensis)					x	x
Deer Mouse (Peromscus maniculatus)				x	x	x
Bushy-tailed woodrat (Neotoma cinerea)					x	
Capper red-backed mouse (Clethrionomys gapperi)					x	
Townsend vole (Microtus townsendii)			x	x	x	x
Oregon vole (Microtus oregoni)				x	x	x
Longtail vole (Microtus longicaudus)				x	x	x
Muskrat (Ondatra zibethica)			x	x	x	x
Pacific jumping mouse (Zapus trinotatus)			x		x	
			x		x	
Porcupine (Erethizon dorsatum)					x	
Nutria (Myocastor coypus)					x	x
Harbor porpoise (Phocaena vomerina)	x					
Killer whale (Orcinus orea	x					
Gray whale (Eschrichtius glaucus)	x					
Red fox (Vulpes fulva)			x	x	x	x
Coyote (Canis latrans)			x	x	x	x
Black bear (Ursus americanus)			x	x	x	x
Raccoon (Procyon lotor)		x	x	x	x	x
Mink (Mustela vison)			x	x	x	x
Longtail weasel (Mustela frenata)			x	x	x	x
Shortail weasel (Mustela erminea)						
Striped skunk (Mephitis mephitis)				x	x	x
Spotted skunk (Spilogale putorius)				x	x	x
River otter (Lutra canadensis)	x		x		x	
Mountain lion (Felix concolor)				x	x	x
Bobcat (Lynx rufus				x	x	x
Steller sea lion (Eumetopias jubata)	x					
Harbor seal (Phoca vitulina richardi)	x	x				
Roosevelt elk (Cervus canadensis roosevelti)			x	x	x	x
Blacktail deer (Odocoileus hemionus columbianus)		x	x	x	x	x

Source: Washington Department of Game, Maintenance Dredging and the Environment of Grays Harbor, Appendix I - Mammals U.S. Corps of Engineers, June 1976.

D. ELEMENTS OF THE HUMAN ENVIRONMENT

1. Population and Economy. Since the plan only addresses a portion of the entire settlement region, it does not and cannot determine in itself population levels to be obtained. However, the estuary is the focus of economic activity of the region. Since population at a regional level tends to follow employment, the provisions of the plan should influence ultimate population levels. The plan appears to have one main potential influence on population growth. The provision of the plan which permits further industrial expansion (in MU 12) would increase the basic economic opportunity in the region. In terms of accepted planning design standard, 500 acres of industrial land can be expected to provide up to 3,000 jobs.* The potential pressure that this number of jobs would place on the region is not expected to be great because of high unemployment. Development in MU 12 is specifically designed to permit adequate space for economic diversification (i.e., something other than activities associated with forest products) to minimize the adverse impacts to the region when the forest products industry is in a slump. As was pointed out in Part III, Grays Harbor County's unemployment rate is substantially higher than the State average. In addition, having improved airports at Westport and Ocean Shores may provide a stimulus to the tourist and fishing industries, resulting in increased employment and possible population growth.

2. Housing. The proposed plan will reduce the potential area which could be utilized for high density housing developments by effectively discouraging and/or limiting the use of shoreline areas for housing. The plan would tend to divert pressure for new housing from shorelines to upland areas. The plan does recognize existing residential development areas in MU's 5, 21, 33, 35 and 37.

3. Transportation/Circulation. With the exception of water transportation and airport siting, the plan does not adversely affect transportation, although indirect effects might be noted along with the plan's impact on water and air transportation.

a. Vehicular Traffic Generation. If the plan were implemented there would be several nodes of increased traffic generation. In most of these situations the actual impact will depend on the particular uses involved. The specific areas include: the Westport Marina (MU 39), Ocean Shores Airport (MU 6), Bowerman Field (MU 12), Morrison Park (MU 17), Junction City (MU 18), Cosmopolis industrial growth area (MU 25) and the south shore area west of South Aberdeen (MU 26).

b. Parking Facilities. Parking is not addressed in the plan itself since parking needs for any development permitted in this plan are addressed in the affected zoning ordinances.

c. Transportation Systems. The plan would tend to strengthen the balanced transportation system of the region by providing for the needed development and maintenance of the port facilities, and by providing for the development (or improvements) of two existing airports. However, the plan could affect the relocation of Bowerman Field and consequently the regional transportation system.

---

* DeChiara, J. and Koppleman, L., Planning Design Criteria, Van Nostrand, Reinhold Co., NY 1969, p. 247

d. Movement of People and Goods. The development of the port and airports would facilitate the movement of people and goods, although a requirement to relocate Bowerman Airfield could impair that movement.

e. Waterborne, Rail and Air Traffic. The plan will facilitate waterborne commerce and increase the opportunity for water-dependent industrial use to locate along the Federal Navigation Channel. This includes all the navigation appurtenances including T-docks, piers, etc. A new rail-loop spur would be required for industrial needs in MU 12, Area 2. The plan is rather restrictive with respect to the conditions which allow airports in the aquatic areas. In the absence of the plan, both the capacities and alignments of the airports might be modified to allow greater development.

f. Traffic Hazards. The plan is not expected to add new traffic hazards, but will make improvements to the Westport and Ocean Shores airport landing facilities. Relocating Bowerman Airport north may increase landing hazards because of its nearness to large shorebird populations and new industrial sites but would have to meet FAA safety regulation standards prior to relocation. The plan considered the improvement to a hazardous highway section in MU 11 and permits bankline erosion control measures to protect highway and railway structures and facilities.

4. Public Services. No unusual or significant impacts are anticipated. Some increase in fire protection for the Bowerman Field area, Junction City South Shore and Cosmopolis would be required if industrial development occurs. By promoting an orderly development pattern, the plan makes it possible to deliver public services to new development more efficiently. This holds true for police protection, parks and recreational facilities and other services.

5. Energy. The plan will not have a direct impact on energy supplies and services, although increased development may lead to an increase in the amount of energy needed. However, such increases would be consistent with the requirements of the general population base. The source of any such energy would be from the existing service pattern.

6. Utilities.

a. Energy. The energy utilities of the region are either adequate now or can be readily developed to serve all envisioned development.

b. Communication. Communication services are either adequate now or can be readily developed to serve the facilities envisioned.

c. Water. Adequate water capacity is generally available to serve the envisioned demand and lines can be readily developed to serve most of the potential sites. Surplus industrial water is available.

d. Sewer. With the completion of sewer system projects under way or planned, sewer service should be adequate to serve most of the development envisioned in the plan. However, additional facilities may be needed depending on the types of industry which might be developed within the plan. Some industries often provide their own water treatment facilities. Such requirements can only be determined when specific uses are proposed. Sewer hook-ups would be required to the newly developed lands.

e. Storm Water. The plan would increase storm water runoff in those areas where wetlands are filled and utilized for industrial purposes or urban waterfront redevelopment (e.g., from paved parking lots, airport runways, docks or buildings). Storm water, if not collected, will flow into the estuary with potential long-term implications to the degradation of estuarine waters, wetlands and wildlife. The severity of the impact will be a function of the type of land use, volume of discharge and management practices which cannot be determined at this time.

f. Solid Waste. The plan does not generally permit the disposal of wood waste or other solid waste material in shoreline areas (as defined by the SMA). Wood waste may however, be utilized as fill material (in combination with other fill material) to create upland development consistent with the plan, if appropriate permits are obtained.

7. Human Health

The plan has no direct impact itself on human health concerns with the exception of concerns over protecting water quality and water storage areas of the Chehalis River floodplain.

8. Noise

The plan generally maintains the present situation related to noise concerns. Urban development and related noises would generally be directed to existing urban areas. The major change in the pattern would be:

o industrial uses in the Bowerman Field area (impacts would depend on particular uses),

o the relocation of Bowerman Airport would reorient related noises,

o relocation of Ocean Shores Airport would reorient and increase noises towards shoreline residential units and into North Bay, and

o development of Westport Airport would lead to increased air noises.

9. Light and Glare

The potential impact of the plan itself on light and glare concern would be minimal. The major potential concerns would be an increase in traffic and activity with industrial development at MU 12 and the features of that concern would depend on the characteristics of the particular uses. The impact of other development opportunities provided in the plan would be largely similar to existing conditions.

10. Land Use

The proposed plan tends to largely reinforce existing land use patterns while providing for a limited expansion of various urban uses in an orderly fashion by directing new development to areas adjacent to development areas. Although the most significant land use change would be the potential to develop MU 12, the most significant overall impact of the plan on land use patterns is substantially to reduce the opportunity to develop various areas intensely. This will conserve undeveloped areas.

11. Risk of Explosion or Hazardous Emission. While the plan itself does not affect this concern, it is possible that some use permitted under the plan could lead to an increase risk of explosion or hazardous emission. Such a situation cannot be now foreseen and therefore is outside the scope of this assessment.

12. Natural Resources

a. Rate of use. The plan will substantially reduce the historical rate of converting aquatic habitats to non-aquatic areas and would limit the conversion of such areas. The plan generally in itself does not affect the rate of use of other resources (fishing, hunting, aquaculture).

b. Continued use of resources. GHEMP attempts to allow the current and future uses of natural resources through its multi-purpose use goal, while at the same time attempting to minimize the conflicts between resource users. No habitat is eliminated or resource use denied on an estuary-wide basis (see Planning Area Guidelines - Management of the Natural Resources, GHEMP pp. 29-47). Use of the water surface for log rafting may eventually be eliminated if need and use by the lumber industry no longer warrants it. The intent of the log rafting policy is to restrict rafting to areas where grounding does not occur. Dredged material may continue to be used as a resource for fill material. The plan also permits continued extraction of gravel resources from the system.

13. Aesthetics and Recreation. In general, the plan will protect and conserve the overall aesthetic quality of the estuary through the implementation of management unit designations which provide for low intensity uses. The plan is expected to assist in reducing urban blight by facilitating the redevelopment of the urban waterfront. By clarifying the appropriateness of commercial uses of the Aberdeen waterfront, increased public access is expected to be provided by the private sector. The plan also specifically encourages the expansion of public access and proposes some public facilities to implement that objective such as the Aberdeen Park in MU 17. It would permit future proposals for boat launching ramps and is permissive with respect to recreational fishing, hunting and resource utilization. The aesthetic quality of the Bowerman Basin will be decreased through fill and development. At present, the site offers one of the most accessible estuarine view points available in the urban area. The proposed development of the area would reduce that opportunity.

14. Historical and Archeological. The proposals embodied in the plan propose no known significant adverse impact on recognized historical and archeological resources. Two historic sites listed in the National Register of Historic Places (Hoquiam's Castle, and the Light Station west of Westport) are all outside the plan's boundary. The SIERRA, a wrecked ship is located near the south shore of the City of Aberdeen in MU 44. The plan will affect the ship nor its historic significance. There are ten known archeological sites located within the boundary area. The sites are shell middens and are close to the water. The majority of these sites are located along the South Bay shoreline where major development is not permitted. Two potential conflict areas are located along MU's 38 and 39 in Westport and along MU's 4 and 5 near the Ocean Shore Marina. Expansion of the Westport marina could have impacts on a shell midden area. Since the Ocean Shores MU's recognize only existing uses, there is no practicable alternative to their designation. Future construction activities would be required to comply with archeological preservation requirements prior to permit approval. Figure 26 shows the sites which have been identified by the Washington State Historic Preservation Officer (J.M. Welch, personal communication, 3/79).

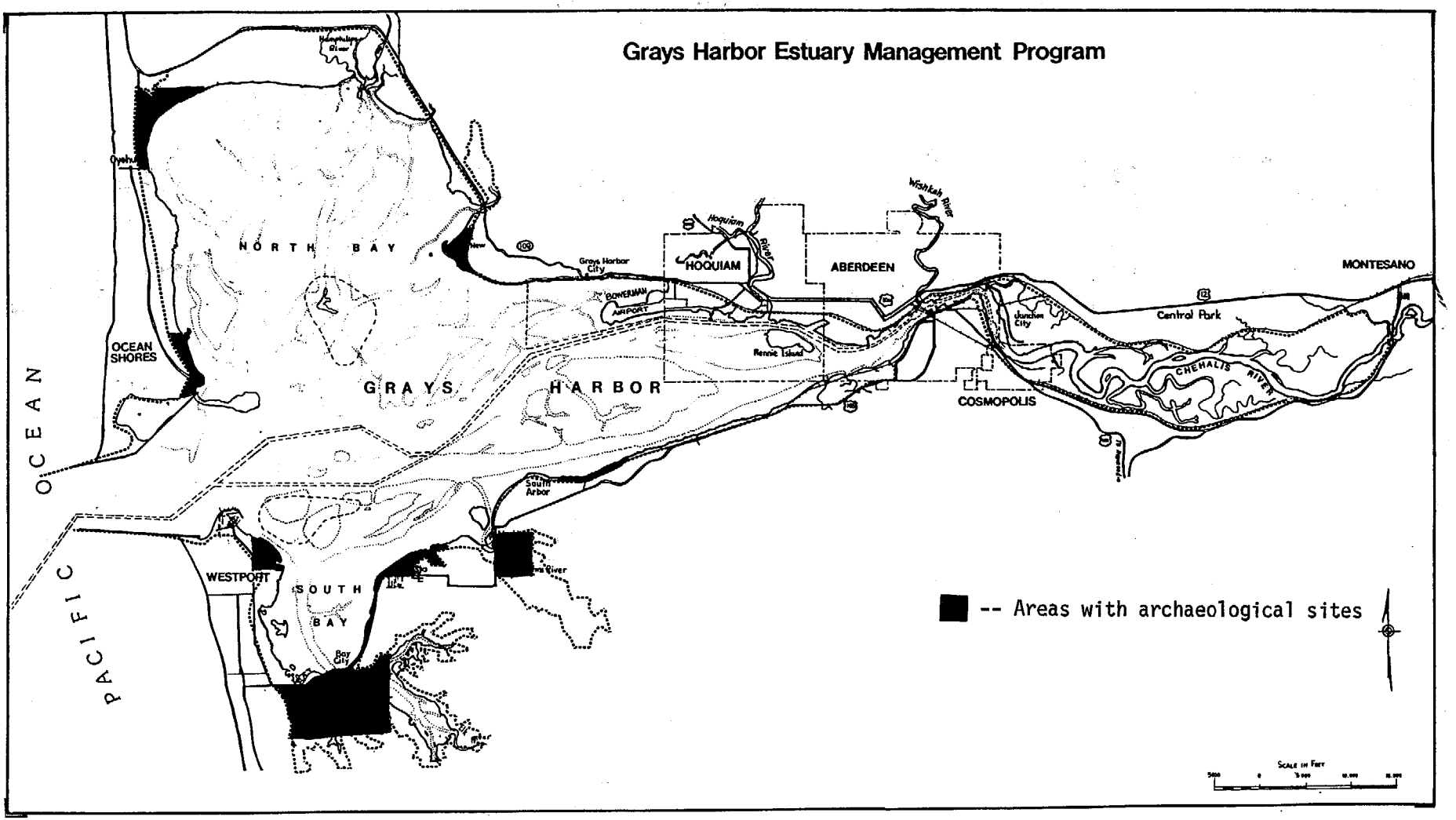

Grays Harbor Estuary Management Program
NORTH BAY
GRAYS HARBOR
SOUTH BAY
OCEAN SHORES
WESTPORT
HOQUIAM
ABERDEEN
MONTESANO
COSMOPOLIS
Central Park
CHEHALIS RIVER
Wishkah River
Hoquiam River
Grays Harbor City
BOWERMAN AIRPORT
Junction City
Rennie Island
South Arbor
Bay City
OCEAN
PACIFIC
-- Areas with archaeological sites

FIGURE 26

E. IMPACT EVALUATION OF PLANNING ALTERNATIVES

1. The planning options of choice identified in Part II include:

- o No Action (or No GHEMP)
- o GHEMP
- o Less Development (including the Citizen's Estuary Plan)
- o Greater Development
- o Dispersing Development
- o Concentrating Development

2. The impact matrix shown below (see figure 27) was developed to broadly summarize the natural, social and economic impacts which may be associated with the various management alternatives. Because of its simple design to convey general development/preservation concepts related to comprehensive planning, it cannot be used for site specific decisionmaking. Rather, it compares the general magnitude of various impacts associated with the different plan alternatives. The GHEMP alternative was used as a baseline on which to judge the other alternatives because of its specificity from which other actions can be evaluated. Impacts are related mainly to the amount and location of potential wetlands fill and shoreline alterations. Figures 28 through 32 generally show where major new industrial/commercial development (both water-dependent and water-related since not all can be located next to the navigation channel) might be located (based upon flat land requirements, allowed or conditionally allowed by existing zoning, etc.) within and around the estuary.

3. Naturally, there is a degree of uncertainty associated with each scenario, but this assessment assumes that development could occur during a long-term period (20 - 50+ years). It does not consider the potential iterations of shoreline development associated with residential development which might be allowed in relatively undeveloped areas such as North and South Bays and along the South Shore. Also, it does not count those shoreline/wetland areas which have previously been filled under the existing local SMP process (i.e., Kaiser fill site (45 acres), Port Slip #2 (70 acres), South Shore dredged material disposal site (179 acres)). These areas will eventually be developed for industrial purposes. While they are important in determining need and alternatives to fill, they will not be considered in the impact analysis of potential future actions. Therefore, the following estimates of acreage (see below) which might be altered over a long-term basis if a demand for space existed are used in the figure 27 assessment.

	Estimated Acres of Altered Shoreline/Wetands
o NO ACTION	1,000 +
o GHEMP	700
o LESS DEVELOPMENT	250
o GREATER DEVELOPMENT	2,000 +
o DISPERSED DEVELOPMENT	1,000 +
o CONCENTRATED DEVELOPMENT	700 +

FIGURE 27

SUMMARY OF NATURAL, SOCIAL AND ECONOMIC IMPACTS OF PLANNING ALTERNATIVES

RESOURCE IMPACTS / ALTERNATIVES	Shoreline Alterations	Wetlands Alterations	Fisheries	Avian Fauna	Other Fauna	Open Space & Aesthetic Resources	Recreation/Cultural Opportunities	Economic Growth & Employment	Transportation Systems	Urban Waterfront Revitalization	Air Quality	Water Quality	Total Score
No Action	4	4	4	4	4	4	3	3	3	3	4	4	44
GHEMP	2	2	3	3	3	3	2	2	2	2	3	3	30
Less Development *	1	1	2	2	2	2	5	6	6	4	2	2	35
Greater Development	6	6	6	6	6	6	1	1	1	1	6	6	52
Disperse Development	5	3	1	5	5	5	4	5	4	5	1	1	44
Concentrate Develop.	3	5	5	1	1	1	6	4	5	6	5	5	42

Potential Adverse Impacts

1 = Least 2 = Slight 3 = Moderate 4 = Substantial 5 = Heavy 6 = Most

* Includes the Citizen's Estuary Management Plan

NOTE

The numbers assigned represent a measure of the degree of potential adverse impacts to the resources identified. The resource categories indicate some of the more significant factors which have been considered by the Task Force members and take into account both the natural environment and the social and economic environment. All actions which include fill and shoreline development will have some degree of impact so zero (0) was not used. Adverse impacts are considered in both a positive and negative sense. That is to say, the least amount of shoreline alterations permitted by an alternative will have the least adverse natural resource impacts, but can potentially have the greatest adverse impacts to the long-term economy of the region. The numbers assigned are necessarily subjective to a degree and in addition to considering the amount of shoreline and wetlands altered along with their subsequent impacts, reflect a philosophy of the planning alternatives. While it may be argued that one factor is more important than another and therefore should be weighted to reflect that importance, all factors are given equal consideration for purposes of this assessment.

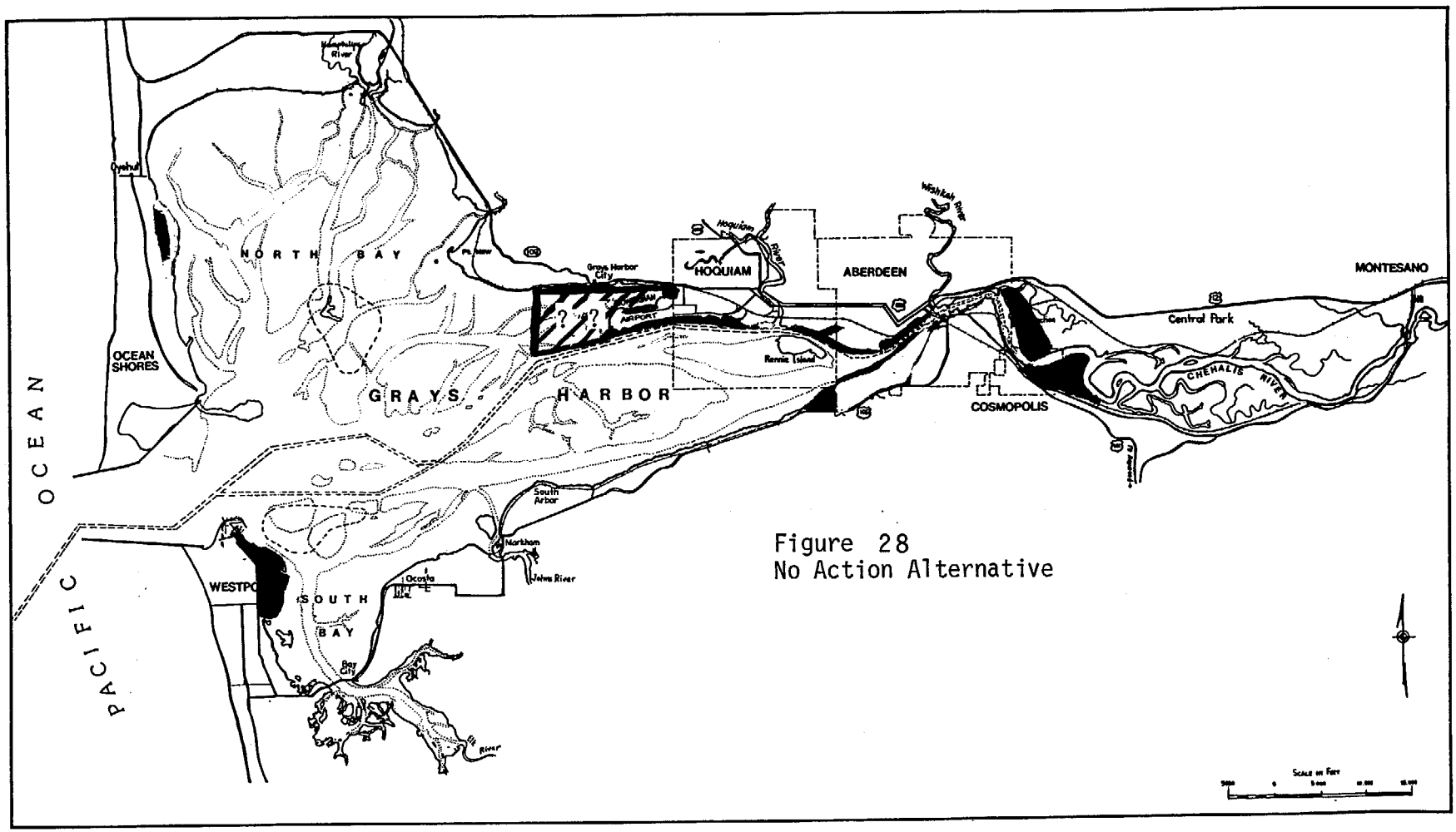


Figure 28
No Action Alternative

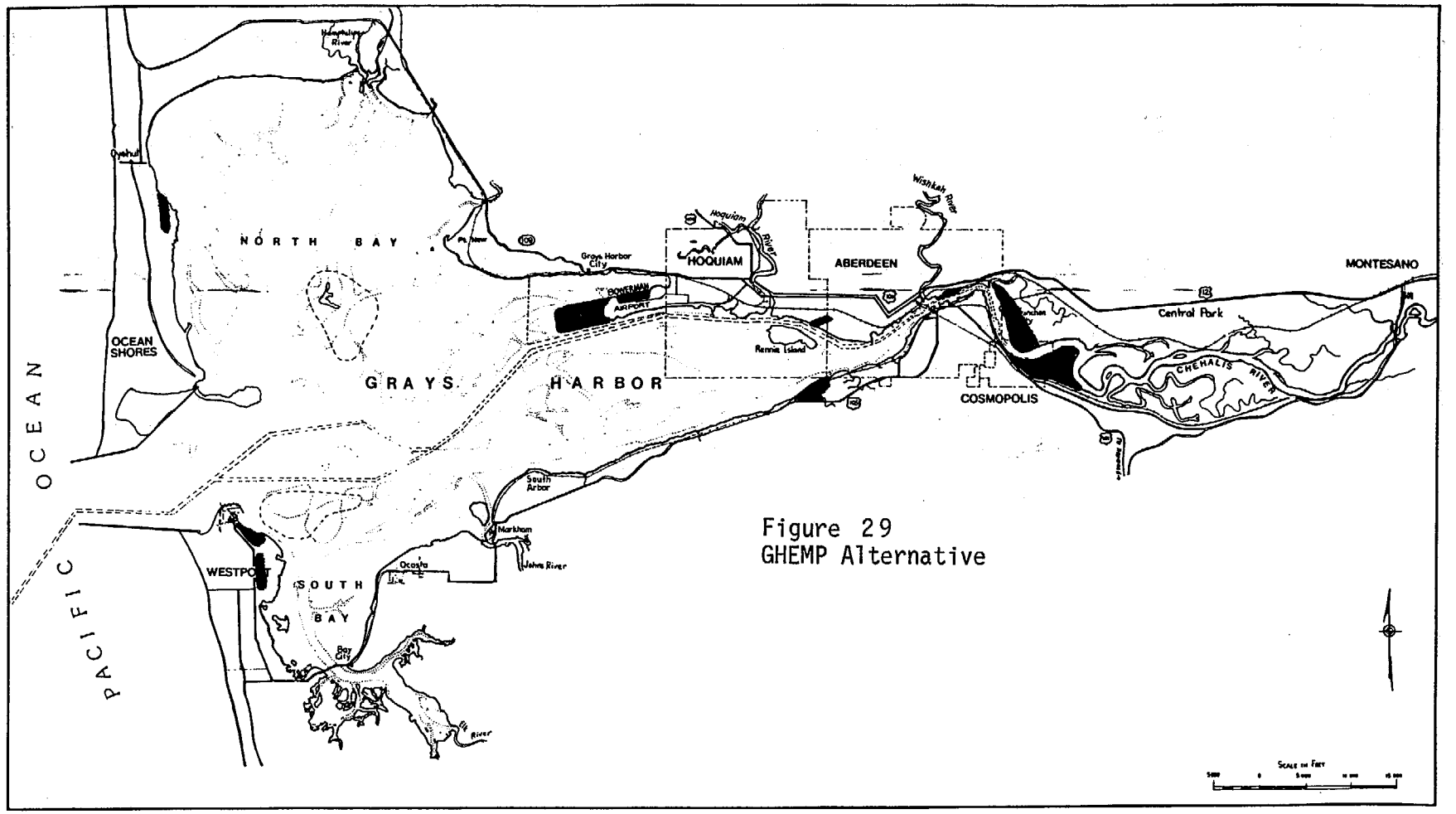


Figure 29
GHEMP Alternative

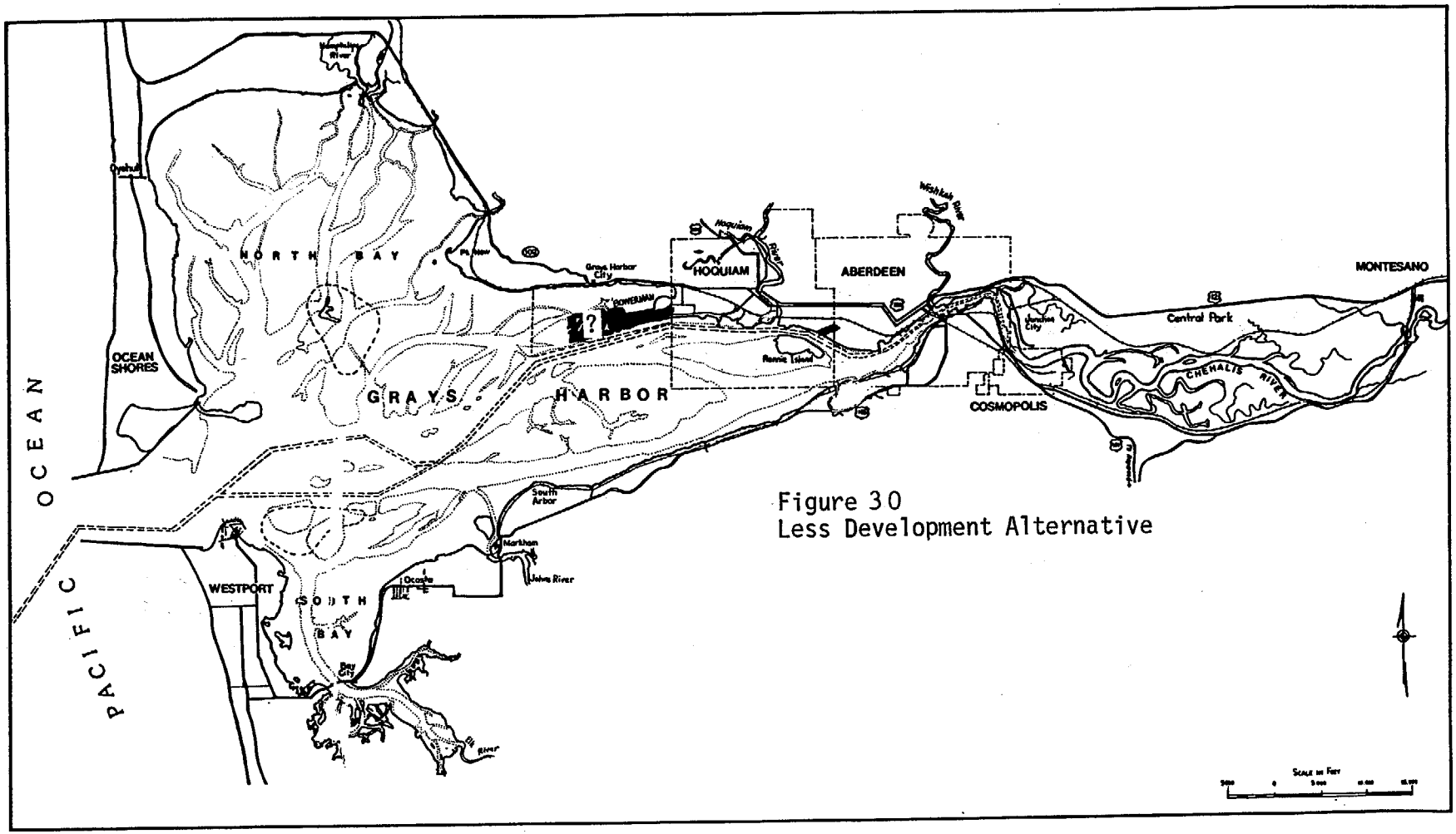


Figure 30
Less Development Alternative

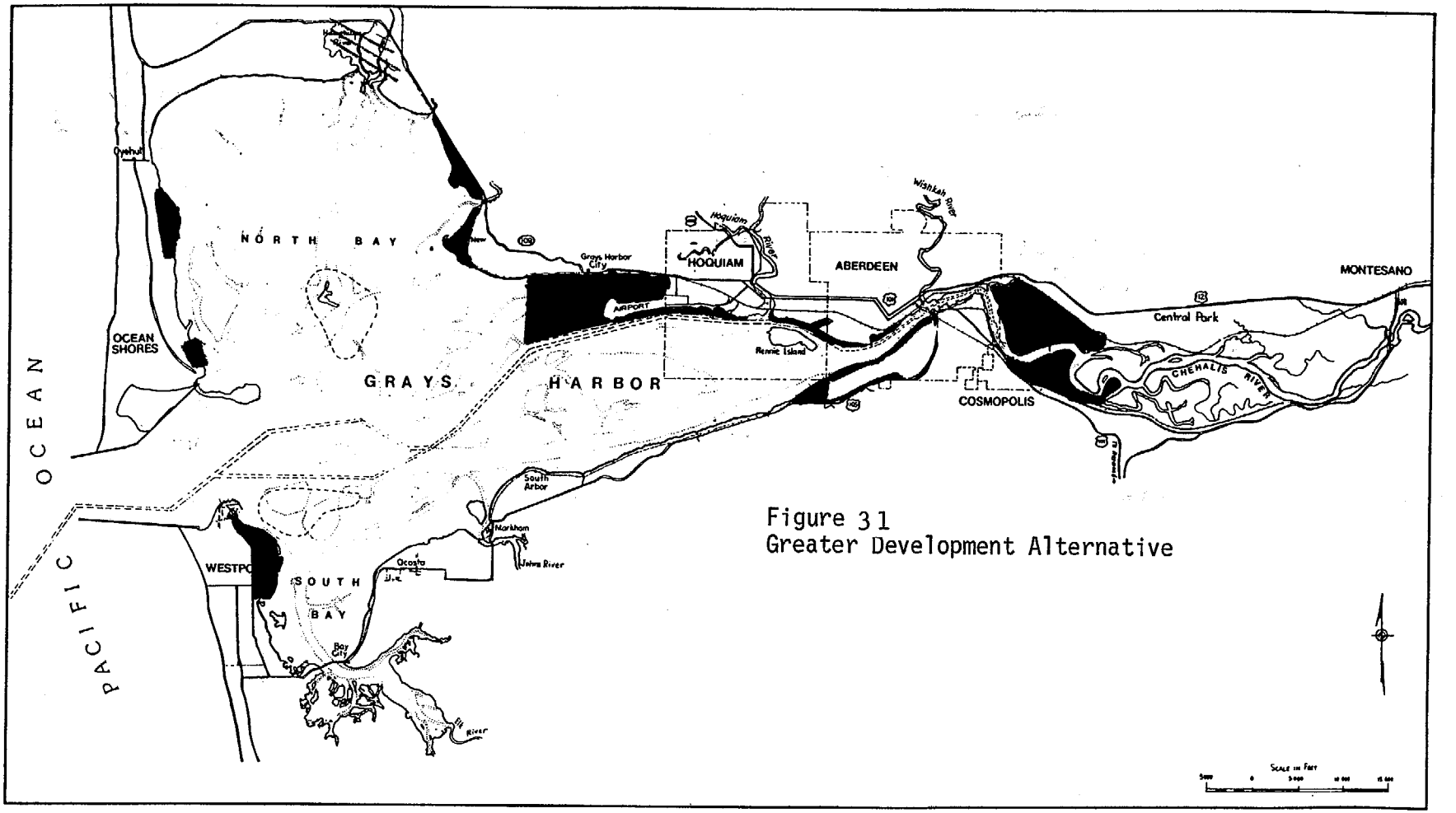


Figure 31
Greater Development Alternative

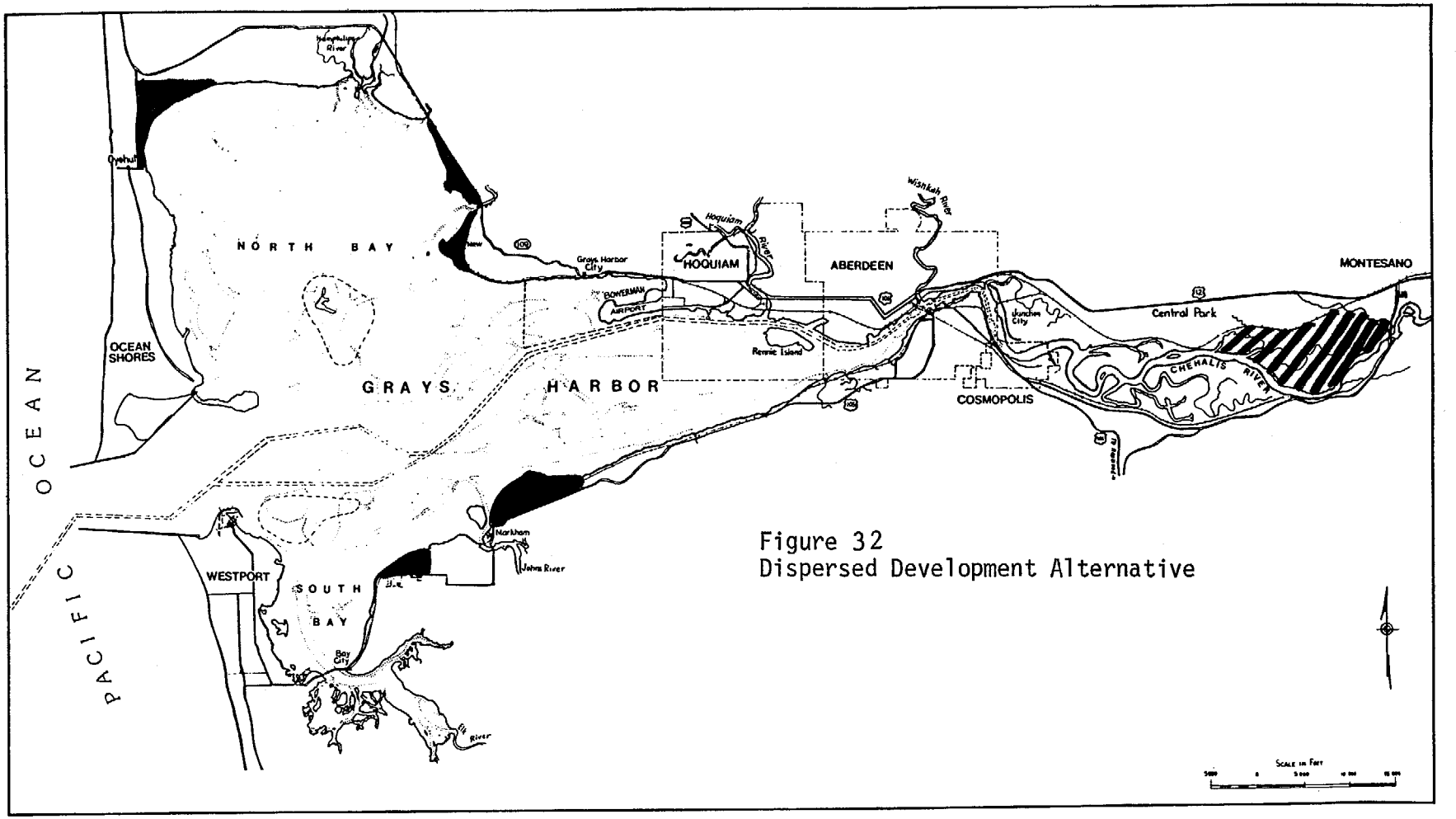


Figure 32
Dispersed Development Alternative

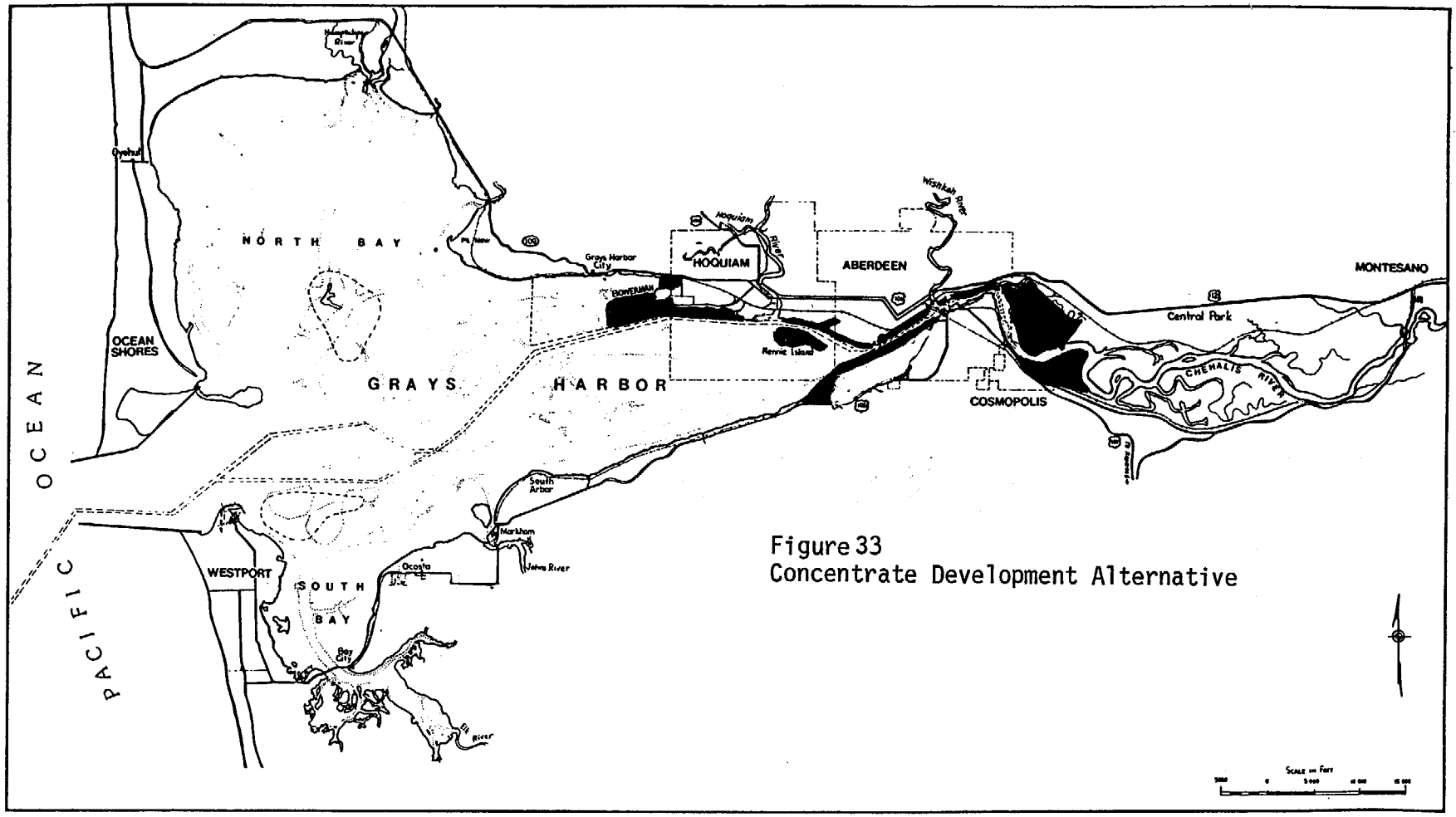


Figure 33
Concentrate Development Alternative

4. Evaluation

a. Shoreline Alterations. The largest amount of shoreline alterations is associated with greater development and dispersed development. If an effort is made to utilize flat land for industrial/commercial purposes, requiring few wetlands alterations, development would have to move away from the central urbanized areas but still have access to transportation (rail, highway and air cargo). Because the development would be removed from the navigation channel, it would likely have to be water related uses (rather than water-dependent) unless new navigation channels were developed and maintained such as the South Channel. Less development has the fewest potential alterations. The no action alternative is considered to be more permissive than GHEMP and there would be greater fill towards the navigation channel, which is also likely under the concentration alternative.

b. Wetlands. Wetlands alterations are similar to the above impacts associated with shoreline alterations with the exception of dispersed development and concentrated development. Dispersed development would require considerable shoreline alterations, but many development sites would be located on uplands beyond the line of aquatic vegetation. Concentrating development would be more costly to intertidal wetlands.

c. Fisheries. Three alternatives (no action, greater and concentrating development) would most adversely impact the fish passage. The least impacts would be associated with dispersing development away from the inner harbor and major fishery habitats. GHEMP protects the fish passage but could have adverse impacts on some English sole nursery habitat in MU 12. Less development would protect more acreage of wetlands but under Phase III (250-acre fill) might permit development in MU 12 along the navigation channel which could also affect fishery habitat.

d. Avian Fauna. Greater development would clearly have the most significant adverse impacts with concentrating development in the inner harbor having the least. GHEMP would have moderate impacts with less development having slight to moderate impacts during Phase III development. No action and dispersed development would have moderate to heavy impacts.

e. Other Fauna. Only two alternatives (greater and dispersed development) have the potential for significantly affecting other wildlife resources because of their encroachment into relatively undisturbed areas.

f. Open Space and Aesthetics. Concentrating development would theoretically retain the most open space and have the greatest aesthetic appeal to larger parts of the estuary. Less development includes development of 250 acres along the navigation channel which would have some adverse impacts to the aesthetic appeal of the Bowerman Basin. Similar adverse impacts would occur under GHEMP, with greater impacts in Bowerman, Westport and Ocean Shores. The most significant impacts would be associated with shifting development into the rural areas of the harbor and include all 2200 acres of the MU 12 under greater development.

g. Recreation and Cultural Opportunities. Greater development provides the most opportunity to increase recreational and cultural activities in and along the estuary. Larger waterfront parks, marinas, recreational support facilities (motels, restaurants, mobile home parks), viewing shipping and milling activities, etc., could be provided in greater abundance even though aesthetic appeal and faunal distribution would be diminished. Both less development and concentrating development would have more adverse (social/economic) impacts, as they would basically not allow any further expansion of marinas into existing wetlands and limit developments in the Westport and Ocean Shores areas, which have the largest concentrations of visitor use.

h. Economic Growth and Employment. The greater development alternative can clearly provide the most opportunity for growth in and around the estuary. This alternative puts fewer constraints on development if the need can be demonstrated. Conversely, the less development alternative permitting only 250 acres of new development in the aquatic area and any further attempts to expand existing facilities would have the most adverse impacts on economic development opportunity.

i. Transportation Systems. The less development alternative would have the most adverse (socio/economic) impacts on proposed or future transportation systems including marinas, airports and on improvements to highways, bridges and railroads. GHEMP has slightly fewer adverse impacts than the no action alternative because it accommodates the Bowerman Airfield relocation at least cost, which the no action alternative might not be able to do.

j. Urban Waterfront Revitalization. Less development would have the most adverse impacts, as it rejects the use of the shoreline for non-water dependent activities. Likewise, concentrating development requires the reservation of the shoreline space for water-dependent industrial purposes related to the navigation channel and the region's economy, thereby making waterfront revitalization more difficult. GHEMP policies and plan provisions specifically take urban waterfront revitalization into account by allowing new industrial development along the navigation channel and revitalization in the older urban areas.

k. Air and Water Quality. Impacts to air and water resources are similiar for the development alternatives. Dispersing development would most likely have fewer air and water quality impacts because of dilution and dispersal factors, although infrastructure costs would be higher. This assumes that any activity or use will meet State air and water quality standards. Greater development and concentrating development more would place the most stress on the estuary air and water resources.

5. Conclusions.

a. The total scores have no particular meaning in and of themselves other than to provide a ranking; however, they can perhaps collectively represent a meaningful evaluation for purposes of a broader level of decisionmaking. There are twelve resource areas. When the total scores are added up and divided by twelve, the overall effects of the various plan alternatives range from slight to substantial. The mean scores include:

ALTERNATIVE	MEAN SCORE	OVERALL IMPACT
o GHEMP	2.5	Slight
o Less Development	2.9	Slight
o Concentrate Development	3.5	Moderate
o No Action	3.6	Moderate
o Disperse Development	3.6	Moderate
o Greater Development	4.3	Substantial

Taken from an estuary-wide, long-term/multiple use planning and management framework, this assessment might very well demonstrate the overall impact between the options of choice. This does not imply that any one individual action will not have a major and significant impact on the human environment.

b. In a simplified way, the conclusions of the matrix demonstrate:

(1). GHEMP, based on joint collaborative planning and including compromises between economic development and environmental protection, has the least overall adverse impact. It is neither the best solution to protect the estuarine environment, nor is it the best for economic development potential. It does, however, strike a balance which gives it the lowest overall adverse impact score.

(2). Less development clearly provides the least adverse impacts to the natural resources of the estuary but has the greatest adverse impacts to the future economy of the region by limiting growth potential. It nevertheless ranks a close second. If the Task Force makes a determination that the less development alternative (specifically the Citizens Management Plan alternative) can satisfy the future social and economic needs of the region after comments are received from the public (and therefore confirms the viability of the alternative), then the less development alternative would be the preferred alternative.

(3). The third best alternative is to concentrate development, (a similar concept is embodied in the GHEMP), but this would require greater industrial utilization of the urban waterfront along the navigation channel. This would impact the migratory fishery resources and still may not provide enough space for the requirements of new industrial users.

(4). The fourth best alternative would be to take no action. The existing local SMP's are rather broad and more permissive than GHEMP. Over time, it is possible and likely that development interests will obtain permits on a case-by-case basis under existing and amended local SMP's.

(5). Dispersing development would require substantial shoreline alterations into rural areas but not necessarily require wetlands alterations unless a navigation channel were to be developed and maintained. Industry (light/heavy) or commercial developments locating along the shoreline would be less dependent on water access but would have flat land and relatively good transportation services available.

(6). The greater development alternative is almost the opposite image of the less development alternative, having the most adverse impacts on natural resources yet providing the greatest opportunity to all types of development proposals.

F. CUMULATIVE IMPACTS

One of the major purposes behind the development of the GHEMP is to prepare a comprehensive plan which can be used as a baseline by all jurisdictions in determining the cumulative effects of incremental fill and development proposals in the estuary. This section provides a general overview of the combined effect the various uses will have on the environment.

1. Figure 34 shows the total extent of shoreline development (including uplands within the study area) and wetlands alterations under GHEMP. This includes both existing uses and proposed allowable future uses. Approximately one-third of the shoreline (32.5 percent) is currently devoted or will be to "development" type environments and two-thirds (67.5 percent) will be preserved in "conservancy" type environments. Ninety-nine percent of the bay waters will be designated in Conservancy or Natural environments.

2. Figure 35 shows a comprehensive picture of the Management Unit designations. This, together with the Standard Use Matrix and the Permitted Activites Matrix, present the best picture of what the potential developments in the estuary will be.

3. The Permitted Activities Matrix (figure 36) shows the types of activities which will be permitted, conditionally permitted, or which will require special conditions to meet special environmental concerns if they are to be allowed. Special project fills, which will have the greatest potential for adverse cumulative impacts, may occur as a special condition activity in MU's 6 (Westport Airport); 12 (Bowerman Industrial Complex and Airport relocation); 14 (Hoquiam industrial expansion - 20 acres - and "T" dock filling); 15 (fills for navigation structures); 18 (fills for navigation structures); 24 (fills associated with road construction); 25 (road, flood control project and other urban activities); 26 (industrial structures and urban development); 38 (Westport Airport); 39 (Westport Marina) and 44 (water-dependent uses).

4. Figure 37 shows the types of the wetlands which would be impacted by the major development projects if all sites are developed under the plan. Impacted wetlands would include:

Wetland Type	Approx. Acres Filled	Estuary's Total Acres	Percent of Total
Freshwater marsh	110	250*	44.0
Low silty marsh	50	1,620	3.0
Low sandy marsh	48	650	7.4
High immature marsh	30	240	12.5
High mature marsh	15-18	1,030	1.7
Sedge marsh	Unknown	152	
Diked salt marsh	Unknown	1,090	
Eelgrass beds	100	11,000+	1.0
Tideflats	350	28,160	1.2
Wooded swamp	Unknown	940	

* Does not include freshwater marshes along the Chehalis River.

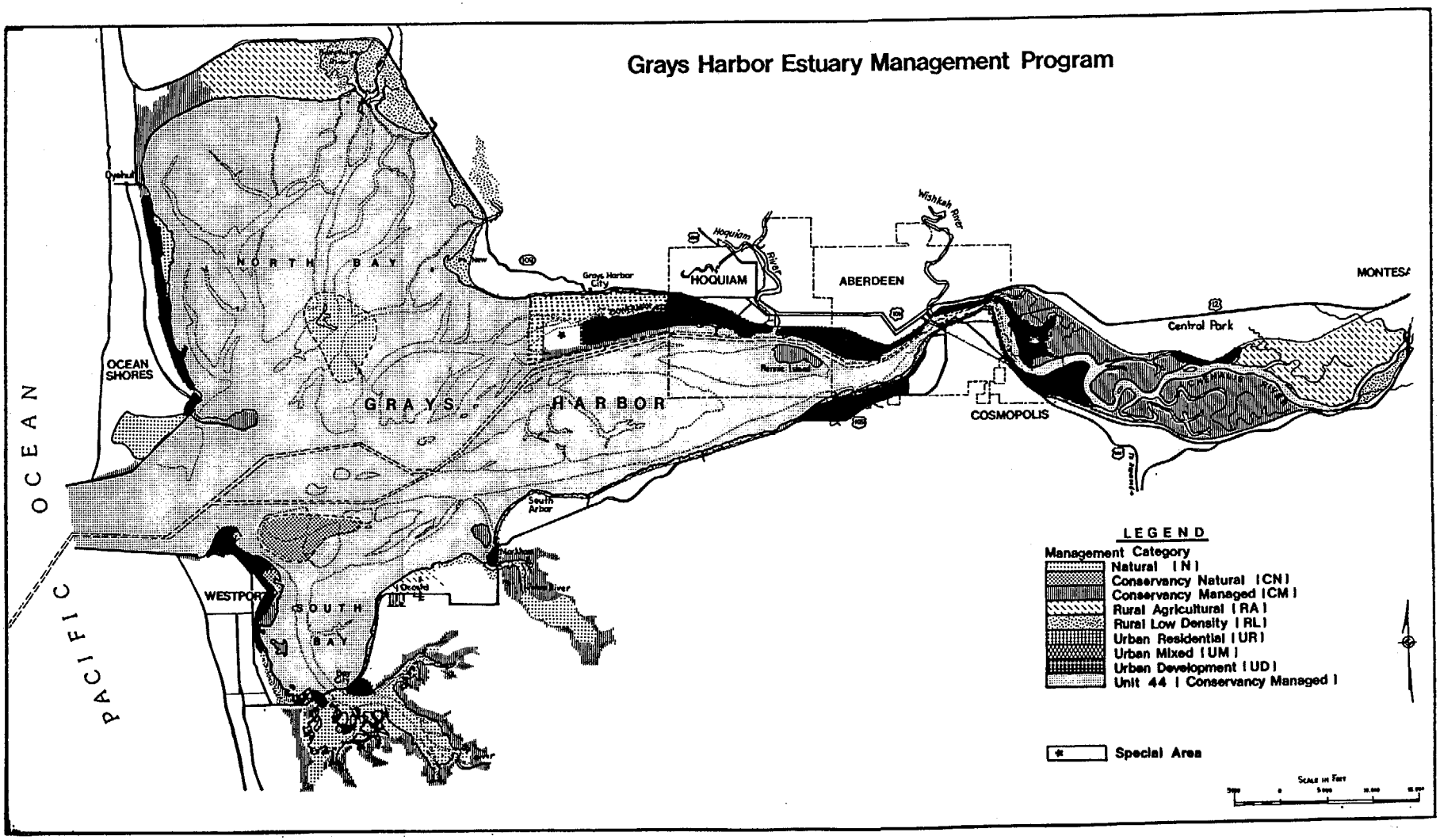


FIGURE 34

Extent of intense urban and residential development.

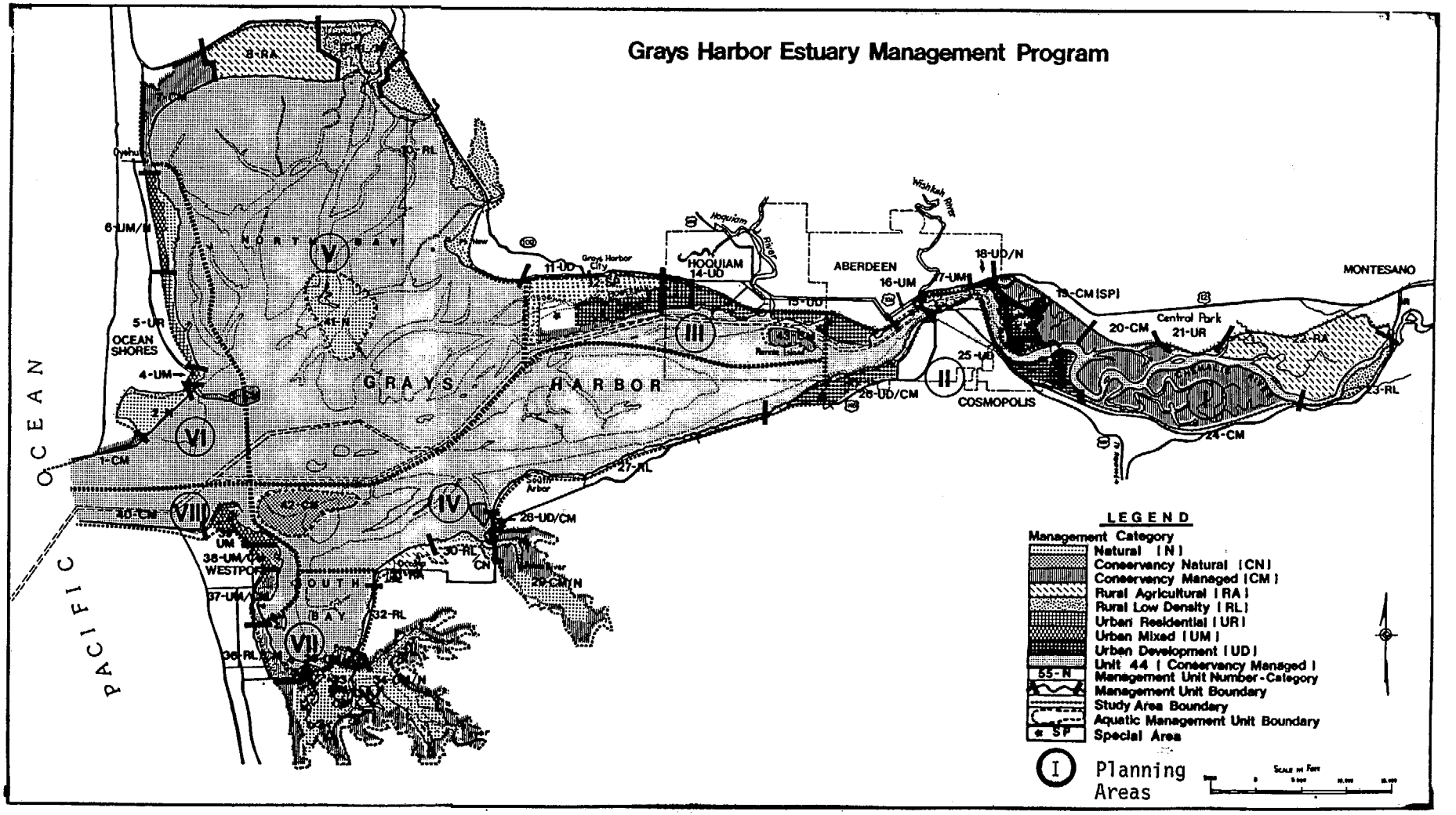


FIGURE 35

Planning Areas and Management Units showing extent of potential land and water use activities.

PERMITTED ACTIVITIES

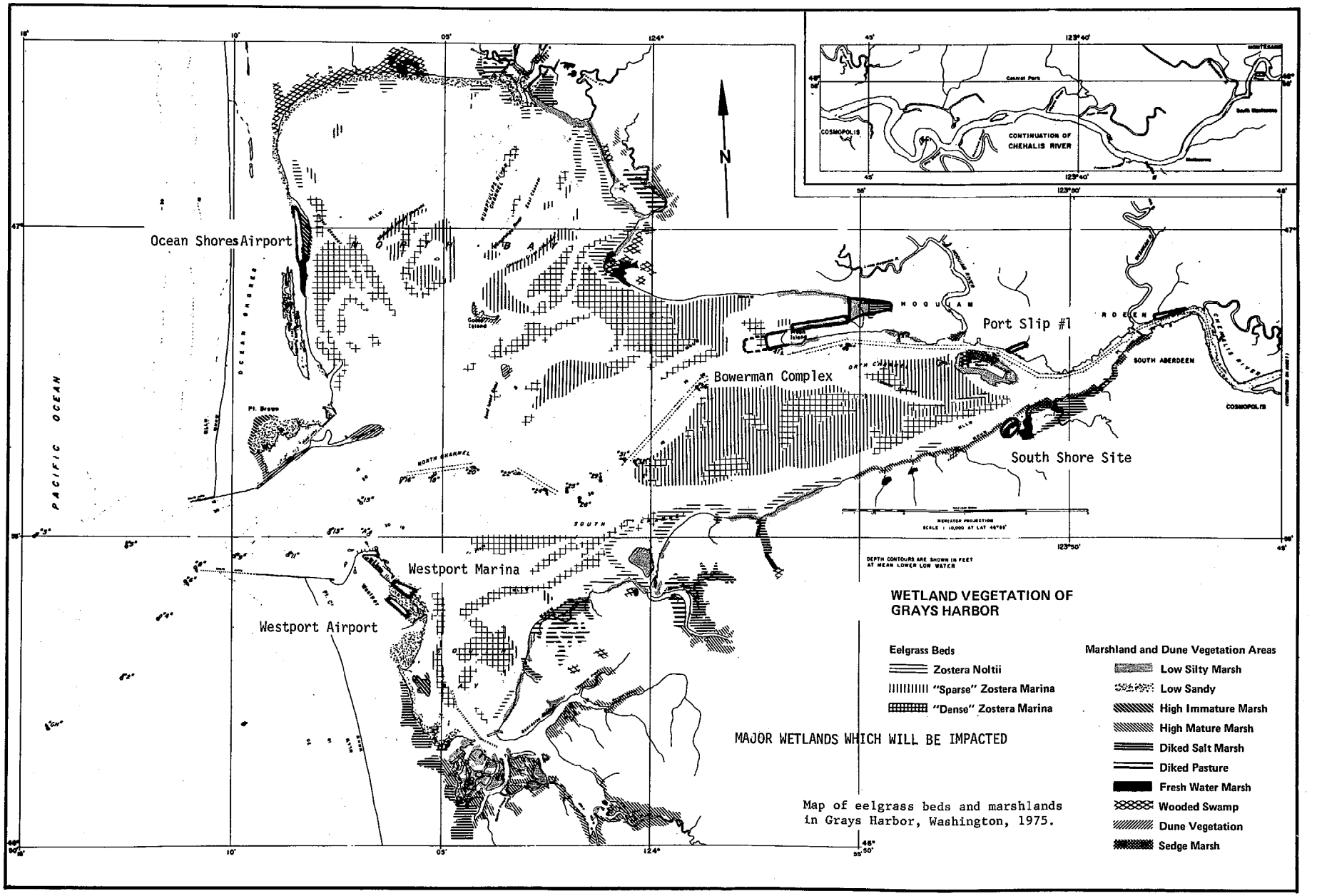
	MANAGEMENT UNIT	1	2	3	4	5	6		7	8	9		10	11	12	14	15	16	17		18		19	20	21	22	23	24	25	26		27	28		29		30		31	32	33		34		35		36		37		38		39	40	41	42	43	44
	MANAGEMENT CATEGORY	CM	N	CM	UM	UR	UM	N	CM	RA	RL	N	RL	UD	SP	UD	UD	UM	UM	UD	N	CM	CM	UR*	RA	RL	CM	UD	UD	CM	RL	UD	CM	CM	N	RL	CN	RA	RL	UM	CM	CM	N	UM	CM	RL	CM	UM	CM	UM	CN	UM	CM	N	CN	CM	CM
STRUCTURES	Piers, Docks, Wharves	■			o						*	*	*		*	*	o	o	o	o				■	■	■		o	o	*		o	*			o	*		*	o	*	■		■	■						■	o	■			■	*
	Piling & Mooring Dolphins				o						*	*	*		*	*	o	o	o	o		■	■	■	■	■	o	o	*	*	■	o	*					■	*	o	*	■		o	■		■				■	o				o	■
	Bridges										o		o				o	o	o	o					o	o	*	*	o	o	o		■	*	*	*	o	*			o	*	■		o	*												
	Causeways																									■		*	*	o																													
	Outfalls	o			*	■	■	■		■			■		*	■	■	o	o	■		*	*	■		■		*	o	o	■	■	■			■	■			■	■			■	■	■	■	■	■	■	■	o				■	*
	Cable/Pipeline Crossing				■						■		■				o	o	o	o		■	■	■	■	■	■	■	*	o	o		■	*			o	*			o	*			o	*			■	*							o	*	*
	Boathouses				o	*				o	*		o				■	■	■	■					o		■		■				■				■	*			■	*			■	*							o					*
	Breakwater	■			o														■																																		o					*
BANK	Diking				■	*	*	*		*	■		■	■	*	■	■	■	■	■					*	■			■	o					■		■		*	*	■		■		■		■		■		■	*	■				■	
	Bulkheading				■	*	*			*			■		*	■	■	■	■	■								■					■				■				■																			
	Groins	o			■													■	■																																			o	o				*
	Jetty	o	■																																																		o	o				*
	Special Project Fills						*	*							*	*	*			*	*							*	*	*																							*	*	*				
	Bankline Straightening														*		o	o	o	*									*																														
	Bankline Erosion Control	o		*	o	*	*			*	o		o	o	*	o	o	o	o	o				o	o	o	*	*	■	■	o	■	*			■	*	■	■	*	*			*	*	■		■		■	*	o	o			■	
CHANNEL	New Access Channel				o										*	■	■	■	■	■		■						■				■																						o					*
	Channel/Berth Maint.				o										*	■	*	■	■	■		■	*	*	*	■	*	■				■																						o					o
	Channel Realignment				■										*	■	■	■	■	■		■						■				■																						o					*

PERMITTED ACTIVITY ○
CONDITIONAL ACTIVITY ■
SPECIAL CONDITIONS ★

STANDARD USES See Standard Use Table

FIGURE 36

Consolidated Permitted Activities Matrix



Map of eelgrass beds and marshlands in Grays Harbor, Washington, 1975.

FIGURE 37

5. Approximately 3850 acres of aquatic habitat have been used for dredged material disposal or fill activities in Grays Harbor from 1940-1975 (Smith, Mudd and Messmer, 1975). Since then, an additional 69 acres have been filled (source: COE). This brings the total estimated acreage filled or impacted by deposits or filled material to 3920 acres. Implementation of the GHEMP over a long-term period will allow an additional 700 acres of fill. From what can be anticipated at this time, this would bring the total acres used for dredged material disposal and/or fill to approximately 4620 acres. Subtidal habitat will continue to be modified due to maintenance of the navigation channel.

6. The most significant changes to intertidal aquatic areas would occur in MU 12 which would allow confined dredged material disposal for fill to permit water dependent industrial development along the North Channel. The plan is designed to accommodate from 164 acres up to 500 acres over a long term period if adverse impacts to peregrine falcons and the shorebird community can be minimized. Filling Area 2 and possibly Area 4 represents the termination of further westward expansion towards the outer harbor once the 1700 acres in Area 1 are turned over to the Department of Game.

7. Further westward industrial expansion along the south shore in MU 26 stops at Chapin Creek, with minor structures permitted over the marshes adjacent to the MU to allow access to the navigation channel. Filling 98 acres of freshwater marsh will eliminate a significant amount of the freshwater habitat along the south shoreline of MU 26.

8. In North Bay the very extensive intertidal mudflats will not be disturbed. The western marsh near Ocean Shores will be impacted once a small airport is developed. The majority of the marsh will be permanently preserved and protected from residential development. The introduction of the airport represents a potentially significant conflict with shorebird use of the adjacent tideflats in North Bay. This will be the major development along with the existing Ocean Shores Marina (with potential channel maintenance) along the west side of North Bay. Much of the residential housing along the shoreline has already been developed.

9. South Bay will remain relatively undisturbed, with eventual expansion of the Westport Marina into the adjacent wetlands being the major development. It is probable that some of the diked saltmarsh habitat will be restored as undiked saltmarsh through mitigation efforts.

10. The shoreline adjacent to South Aberdeen, Cosmopolis and Junction City will continue to be modified having potential adverse effects on the migratory fish passage.

11. On a long-term, comprehensive basis, there is nothing to indicate that overall species diversity will be diminished by the proposed action. There will be adverse impacts to wintering and migratory shorebirds through the loss of feeding and roosting sites in the harbor and possibly other factors (land and water use activities) causing stress. However, those impacts cannot be quantitatively assessed at this time without further monitoring (pre/during/post activities). At this point, it is not believed that impacts are "unacceptable" even though any adverse impact is deemed "undesirable." Should future information concerning the shorebirds (main prey of the peregrine falcon) show unacceptable impacts, formal Section 7 consultation would be reinitiated and revisions to the plan may be required. The mitigation measures are intended to ensure to the maximum extent practicable the long-term usability of the Bowerman Basin to the avian fauna.

G. RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

1. The proposed GHEMP represents an effort to coordinate policy and management regulations pertaining to the estuary. Implementation of the proposed plan through amendments to existing SMP's will result in the modification of policies and regulations presently existing, rather than in the initiation of new regulation in an area previously unmanaged. As indicated elsewhere in this document, the State SMA recognizes (in areas designated as shorelines of statewide significance) the importance of giving proper consideration to uses which emphasize long-term over short-term benefits. The proposed plan is consistent with this policy. It will allow some short-term uses of the environment, while at the same time protect the long-term productivity of the natural system's resources for the benefit of future generations.

2. In some instances designation of lands and water for high-intensity uses under the plan may result in both short and long-term economic gain, while designation for conservation or preservation may result in foregone economic opportunities. Since the estuary is presently under the management control of local SMP's and other environmental regulations, these assumed land value changes may actually represent a shift of values within the estuary (i.e., industrial development in MU 12 vs. the fish passage) rather than an economic loss or gain for the total estuary area. Without the plan, there may be a loss of both economic and environmental values.

3. Another short-term use effect of the proposed plan is the designation of specific areas for particular agreed-upon projects. While these projects will result in diminished environmental quality at the specific sites, special conditions have been included within the plan to assure that degradation is minimized. Also, marsh creation and marsh restoration projects are included within the proposed plan under some areas (i.e., MU 12, MU 43) and will act to restore areas previously degraded, potentially resulting in the long-term enhancement of the estuary. The major projects with their gains and losses include:

a. Management Unit 12 - Bowerman Basin

(1). Gains. The creation of long-term industrial site in the most appropriate area for urban services. Increased employment opportunity, governmental revenue and enhanced economic viability. Also, potential increased capacity for dredge material disposal (estimated at a savings of $12,000,000 over alternative disposal methods). Decreased costs associated with airport relocation. Permanent protection of 1700 acres of valuable fisheries and shorebird/raptor habitat.

(2). Losses. Up to 500 acres of aquatic habitat impacting the food webs of both avian fauna and fishery resources.

b. Modification of Port Slip No. 1

(1). Gains. Improved capacity for cargo exports with related gains in regional employment and income. No future maintenance dredging needed to keep slip operational.

(2). Losses. A 20-acre reduction in sub- and intertidal area which has already been highly modified, some reduction in food production for fish, and a minor modification of the migratory fish route.

c. Westport Boat Basin

(1). Gains. A substantial increase in the opportunity for boat moorage with related increased opportunity for recreation and commercial fishing.

(2). Losses. Eliminate 48 acres of marsh and subtidal area, with related losses in primary productivity and food production for fish, and possibly slight reduction in water quality in the immediate vicinity of the basin.

d. Westport Airport

(1). Gains. Substantial improved air safety for existing uses. Potential for attraction of greater tourism with resulting gains in income and employment.

(2). Losses. Reduction of high marsh land (already impacted by existing airport use) with related losses in biological productivity.

e. Ocean Shores Airport

(1). Gains. Improved and safer airport for the Ocean Shores community. Permanent protection of 200 acres of wetlands.

(2). Losses. Thirty acres of wetlands, diminution of buffer strip between North Bay and Ocean Shores residences. Additional stress on avian fauna.

f. Aberdeen Park

(1). Gains. Improved public access, increased recreational opportunity and reduced urban blight in MU 17.

(2). Losses. Limited loss of intertidal area (about 1.3 acres) with some alteration to the migratory fish route.

H. UNAVOIDABLE ADVERSE IMPACTS

The following list summarizes the adverse impacts which would occur if the GHEMP is implemented:

o The topographical features of the estuary will be changed by dredged material disposal and filling in areas where such activities are permitted, conditionally permitted or specially conditioned.

o Existing soils and land areas will be modified wherever development is permitted, reducing natural absorption of storm waters.

o There will be a slight reduction in the tidal prism of the estuary by approximately one percent below existing conditions.

o Urban development in some areas will increase air emissions, make minor changes in hydraulic patterns resulting in minor changes in erosion and deposition of sediment.

o Temporary reduction in water quality during dredging and construction of various projects would occur.

o The removal of up to 5 percent of the remaining salt marsh of the estuary, a slight removal of eelgrass beds, and the removal of other forms of vegetation in areas designated for urban uses would be permitted.

o The removal of an estimated one percent of the aquatic area of the estuary, with a resulting reduction in the number of fauna utilizing the bay, would be permitted. The most significant of these is the covering of benthic communities in filled intertidal areas and the destruction of some shorebird and fishery habitat.

o Some changes in the patterns of noise, light and odor would occur, most notably relating to industrial use of the Bowerman area and relocation of airports.

o Some land use patterns would be modified, reducing the shoreline area potentially available for housing, increasing traffic generation wherever development is permitted, and increasing the consumption of energy in the region.

o The plan limits future options along the shoreline.

I. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

When the GHEMP is implemented through local government adoption and permit issuance (i.e., Section 10/44, shoreline development permits, etc.), a number of actions if implemented would be considered as irreversible and irretrievable commitments of the estuary's resources.

o A commitment to fill approximately 500 acres in MU 12. The plan allows this commitment to be modified only if impacts are later shown to be unacceptable to the significant avian community based upon the results of monitoring activites or new information.

- o A commitment to modify Port Slip No. 1 (permit has been issued).
- o A commitment to expand the Westport Marina.
- o A commitment to develop the Westport Airport.
- o A commitment to construct a waterfront park in Aberdeen.
- o A commitment to construct an airport at Ocean Shores.
- o A commitment to allow up to two acres of fill to straighten banklines in limited areas.
- o A commitment to allow the protection of banklines from erosive forces.

Each of these commitments involves a modification of the aquatic area of the estuary which cannot in practical terms be reversed.

- o A commitment to preserve 1700 acres of prime shorebird habitat in MU 12 and 190 acres of marsh at Ocean Shores in MU 6 through the transfer of lands from private to public ownership.
- o A commitment to abide by the management categories, especially in the cases of natural or conservancy environments, to protect these areas from significant adverse modification. While plan modifications may be made through the amendment process, approved amendments must provide balanced protection of the estuary.

J. RELATIONSHIP TO EXISTING LAND USE PLANS, ZONING AND REGULATIONS

1. Local

a. County Planning and Zoning. The proposed plan would significantly reduce the area available for higher intensity levels of development from that currently permitted in the county comprehensive plan and zoning ordinances. The most notable of these are a reduction of industrial zoning in the Junction City area, a reduction in industrial zoning plans and further limitations on the use of industrial areas on the south shore of the estuary, and a prohibition on industrial use in Area 1 of MU 12 of the proposed plan. In aquatic areas where the county comprehensive plan and zoning ordinances provide for low intensity uses, the proposed designations and policies of the estuary plan generally represent a refinement of existing regulations which could increase restrictiveness. However, the plan produces little change in upland areas which are planned and zoned for low intensity uses.

b. City of Aberdeen Comprehensive Plan and Zoning Ordinance. The provisions of the plan do not directly conflict with any specific provision of the plans and zoning of the city, but the policies of the plan would increase restrictiveness in the degree to which water areas may be modified by filling. While the present zoning ordinance zones this water area as "industrial," the proposed plan would not allow most of this area to be filled.

c. City of Hoquiam Comprehensive Plan and Zoning Ordinance. The proposed plan has much the same relationship to the Hoquiam land use regulation as in Aberdeen, except that in addition to further restriction of potential shoreline modification, use of waterfront areas are further limited by means of a preference for water dependent and related uses.

d. City of Cosmopolis Comprehensive Plan and Zoning Ordinance. The relationship and impact of the plan on Cosmopolis is similar to the impact on Aberdeen's.

e. Ocean Shores Planning and Zoning. The proposed plan is highly compatible with the City of Ocean Shores planning, zoning and other forms of land use controls. The only exception is that the salt marsh area planned for the airport is now zoned in its entirety (240 acres) for residential uses. Residential development would be a non-permitted use of the marshes.

f. Westport Planning and Zoning. The proposed plan would reduce the area planned for intense development by limiting use of several large marsh areas in the city limits.

g. Shoreline Regulations. The plan generally constitutes an amendment and clarification to the local Shoreline Master Programs which are now in effect within the entire area. The relationship might be most effectively summarized as a more detailed plan providing clarification of ambiguous provisions in the SMP's. The clarifications include more specific environment designations, particularly waterward of the high water mark or §404 jurisdiction, policy guidance and identification of types of permitted activities within specific environments. The types of changes to environment designations have been previously addressed on page II-6.

2. Regional

a. The proposed GHEMP, when adopted, would be one element of an entire Regional Plan which is described in a "Summary Statement for Land Use and Housing Element Certification" which was developed with assistance from the Department of Housing and Urban Development. This document is on file at the offices of the GHRPC. Elements of this Regional Plan which are particularly related to and affect the estuary, include:

- The Water Quality Element
- The Erosion Control Element
- The Open Space and Recreation Element
- The Overall Economic Development Element
- The Regional Land Use Element
- The Flood Control Element
- The Regional Circulation Element.

Other GHRPC planning documents were used in the development of the GHEMP and are also on file at the Commission's offices.

3. State

a. The Washington Shoreline Management Act (SMA). The SMA was adopted by the State of Washington Legislature in 1971. It provides the foundation for the management program of the State's shorelines. The act's jurisdiction includes all marine water areas of the State, streams with an average annual flow of 20 cubic feet per second or more, and lakes larger than 20 acres. Also included are lands adjacent to these waters extending 200 feet landward from the ordinary high watermark and all marshes, bogs, swamps, floodways, river deltas, and floodplains associated with the main water bodies. The GHEMP includes the Grays Harbor estuary area from the harbor entrance jetties, up the Chehalis River to its confluence with the Wynoochee River just south of the town of Montesano. The area generally conforms to the jurisdictional boundaries established under SMA described above, but also includes a small number of additional areas outside this jurisdiction.

(1). The SMA requires and defines a planning program and regulatory permit system, both of which are initiated at the local level under State guidance. In accordance with these requirements, those local jurisdictions within the boundaries of the proposed Grays Harbor Estuary Plan have adopted their respective shoreline master programs (SMP's). Inherent in the policy of the SMA is the necessity for coordinated planning for the State's shoreline resources. While local SMP's for the estuary have been adopted and have become part of the State's Coastal Zone Management Program, the responsibility for decisionmaking on various land/water resource actions continues to fall on a variety of local, State and Federal agencies, each having its own policies or regulations. Under RCW 90.58.020, the Washington State Legislature found a "clear and urgent demand for a planned, rational and concerted effort, jointly performed by federal, state and local governments, to prevent the inherent harm which would result from uncoordinated and piecemeal development of the state's shorelines."

(2). This identified desire to promote coordinated planning of the shoreline resource is further addressed under RCW 90.58.340:

> All state agencies, counties, and public and municipal corporations shall review administrative and management policies, regulations, plans, and ordinances relative to lands under their respective jurisdictions adjacent to the shorelines of the state so as to achieve a use policy on said land consistent with the policy of this chapter, the guidelines, and the master programs for the shorelines of the state. The department may develop recommendations for land use control for such lands. Local governments shall, in developing use regulations for such areas, take into consideration any other state agencies or units of local government.

The combined efforts of the Task Force members have resulted in a proposed plan which resolves inconsistencies between the various adopted policies and regulations presently found at the local, State, and Federal levels. The proposed plan is a progressive effort representing a comprehensive set of guidelines, management objectives, and use regulations for the entire estuary. It is the type of coordinated planning program envisioned under the SMA.

(3). With regard to specific uses, the act places a strong emphasis upon a balance between conservation of the resource and use of the shoreline. Under RCW 90.58.020 the legislature declares that "unrestricted construction on the privately owned or publicly owned shorelines of the state is not in the best public interest," an interest which should be protected through coordinated planning as discussed earlier, while "at the same time, recognizing and protecting private property rights consistent with the public's interest." Under RCW 90.58.020 the legislature further declares that it is the policy of the state to provide for the management of the state's shorelines "by planning for and fostering all reasonable and appropriate uses" and that this policy is designed to:

> insure the development of these shorelines in a manner which, while allowing for limited reduction of rights of the public in the navigable waters, will promote and enhance the public interest. This policy contemplates protecting against adverse effects to the public health, the land and its vegetation and wildlife, and the waters of the state; while protecting generally public rights of navigation and corollary rights incidental thereto.

(4). More specific priorities regarding shoreline use preference are given for shorelines of statewide significance. This is particularly significant to the proposed Grays Harbor Estuary Plan since the GHEMP has been designated as a shoreline of statewide significance by the Legislature under the SMA. Specifically, SMPs for such designated areas must provide use preferences that:

- recognize and protect statewide interest over local interest,
- preserve the natural character of the shoreline,
- result in long-term rather than short-term benefits,

- o protect the resources and ecology of the shoreline,
- o increase public access to publicly owned shoreline areas, and
- o increase shoreline recreational opportunities for the public.

(5). Another policy statement of the SMA particularly relevant to the subject of use preference is again found under RCW 90.58.020. "...the public's opportunity to enjoy the physical and aesthetic qualities of natural shorelines of the state shall be preserved to the greatest extent feasible consistent with the overall best interest of the state and the people generally. To this end, uses shall be preferred which are consistent with control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon use of the state's shoreline." While the act does not prohibit all nonwater dependent uses, there is clear intent to establish a preference for water dependent uses.

Throughout the GHEMP process, considerable weight has been given to the policy regarding water-dependency. In viewing the proposed plan in total, priority for uses has closely followed the policy and intent of the act, including the criteria for shorelines of statewide significance. The proposed plan recognizes the estuary as a valuable natural resource: important for food chain production; anadromous fish feeding, rearing and migration; and wildlife habitat. It also recognizes the estuary as an important navigational transportation corridor between local, national and international markets, serving as a focal point for the regional economy. The basic thrust of the proposed plan is to require water dependent development as a requisite to major shoreline alterations. There are a few specific areas which may, within the context of the total plan, be allocated to non-water dependent uses such as airports (MU's 6, 12, 38), industrial development (MU 14-Area 7) and urban revitalization of existing shoreline (MU's 16 & 17). The planning effort has given substantial consideration to MU 12 and has determined that the balance derived from allowing continued industrial expansion in that part of the estuary abutted by existing industrial development and urban services, while assuring future resource protection for nearly ninety-nine percent of the estuary, is a reasonable and appropriate use of the shorelines and is in the public's interest.

(6). The SMA contains language dealing with adoption procedures of local SMP's and amendments to these programs. In the process of adopting the proposed plan as an amendment to the previously approved local program, the SMA will be observed.

(7). Basically, RCW 90.58.100 provides that in preparation of amendments to SMP's, the DOE and the local government shall provide a sound data base as a first step. The proposed GHEMP is based on data pertinent to the estuary system, including vegetation and wildlife, existing uses, soils and sediments, hydrology and others. The consultants have provided studies, inventories, and surveys of the estuary for the consideration of the Task Force members.

The second step in preparing a SMP or an amendment to an existing program is the formulation of goals and policies. In regard to the proposed plan, the overall goal of managing the estuary for multiple use is supported by general policies at the planning area level and more specific management objectives

for each separate MU. Also, as required by the SMA, the proposed plan contains an introductory section, charts, definitions, and plan map to assist readers in ease of understanding.

While the SMA does not prescribe specific guidelines for public involvement in the master program amendment process, it has been used for guidance. RCW 90.58.130 requires that, in the original development of local shoreline master programs, reasonable efforts must be made to inform people about the proposed shoreline master program by inviting and encouraging public participation of private groups and entities who show an interest. All Federal, State, and local governments with an interest are also encouraged to participate.

While the proposed GHEMP was developed by the Estuary Task Force Committee, (a group of local, State, and Federal agency representatives), public involvement was also invited. The drafting of the proposed plan was initiated through a process of extensive interviews with people and representatives of groups with an interest in the estuary planning program. In addition, all meetings of the Task Force were open to the public and notification of those meetings was publicized in local newspapers. A public hearing on a draft proposed plan was held February 21, 1978, and comments resulting from the hearing were considered by the Task Force.

In addition to the public input already provided, this NEPA/SEPA document will allow for thorough review and comment on the proposal.

The final phase of the GHEMP development will be its adoption at the local level and amendment to the existing shoreline master programs. Each affected entity (six) will hold a public hearing, preceded by proper legal notice, at the local level. Modifications to the local master programs will be processed and evaluated by the Department of Ecology through State administrative procedures established under the SMA. Basically, the Department will review the proposed amendments to determine consistency with the SMA and the Final Guidelines.

b. Other. The purpose of the State membership on the Task Force is to ensure to the maximum extent practicable the consistency of the plan with other significant State laws and regulations. For Grays Harbor this includes:

(1). State Forest Practices Act (RCW 76.09) - passed to protect water quality of the streams and to ensure continuing productivity of the timber lands of the State. The shorelines in the GHEMP are restricted to non-damaging forest practices.

(2). Hydraulics Project Approval Law (RCW 75.20) - attempts to control stream diversions or other actions that change natural streamways. GHEMP affords this protection to the tributary streams and sloughs by requiring minimum 50-foot buffer zones.

(3). Tideland Ownership and Leasing. The State has ownership responsibility of the beds (unless previously sold) and shore of all navigable waters of the State up to the line of ordinary high water. The Department of Natural Resources holds the aquatic lands in trust for all the people of the State and employs multiple use concepts to best satisfy the variety of needs of the people. Some tidelands in Grays Harbor have been granted, sold and

leased (see attach. 1, map 2). Management of aquatic lands includes guidelines for navigation and commerce, public use, food, mineral and chemical productions, protection of the natural aquatic environment, uses by abutting upland owners, and revenue production. GHEMP is consistent with this multiple use policy and ownership patterns.

(4). State Environmental Policy Act (RCW 43.21C). GHEMP satisfies the requirements of SEPA to foster and promote the general welfare, create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Washington citizens. This PEIS satisfies the administrative requirements of the law.

(5). Miscellaneous Water Quality Controls. GHEMP is consistent with other State requirements governing shellfish harvesting, the pollution block line established by the DOE governing maintenance dredging during the summer months, and other DOE regulations governing polluting materials and effluents deposited into the estuary.

4. Federal

a. Coastal Zone Management Act (16 U.S.C. 1451, et. seq., as amended). The GHEMP, the planning process and the proposed amendment to the State CZMP are consistent with the CZMA Findings (§302) and Policies (§303). The findings state the importance of resolving conflicts between competing demands placed on fragile coastal ecosystems and of developing a forum and management system which will allow such resolution. Both the findings and policies encourage Federal, State and local governments to work together with other vitally affected interests in developing comprehensive land and water programs for the coastal zone. The CZMA encourages "the preparation of special area management plans which provide for increased specificity in protecting significant natural resources, reasonable coastal-dependent economic growth, improved protection of life and property in hazardous areas, and improved predictability in governmental decisionmaking." (§303(3)). The GHEMP is one form of special area management planning designed to meet those objectives and was partially funded through the CZMA. The plan attempts to "preserve, protect, develop, and where possible, to restore or enhance" the estuary's resources for this and future generations by "giving full consideration to ecological, cultural, historic, and esthetic values as well as to needs for economic development." (§303(2)). Once a final version of the GHEMP is approved by local governments and the State, the plan will be reviewed as an amendment to the Washington State CZMP and, if approved, federal consistency will apply.

b. Clean Water Act (CWA, §404, 33 U.S.C. 1344 et. seq.). The purpose of §404 of the CWA is to restore and maintain the chemical, physical and biological integrity of the water of the U.S. through the control of discharges of dredged and fill materials. Dredged and fill material should not be discharged into the aquatic ecosystem, including wetlands, unless it can be demonstrated that such discharge is necessary, there are no practicable alternatives, and the discharge will not have an unacceptable adverse impact either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern. The GHEMP has been revised from previous drafts in order to be consistent as much as possible with the implementing regulations of Corps of Engineers and EPA's §404(b)(1) Guidelines. The law and regulations

encourage comprehensive resources planning and firmly state that approved coastal resource management programs which have evaluated alternatives and have a reasonable degree of specificity can be used to satisfy several of the documentation requirements for permit applicants (40 CFR Part 230.10(a)(5)). However, since it may be many years before any particular activity is proposed, specific information and evaluations must be made at the time of a permit application, and additional information will be required as a supplement to the plan and this PEIS.

c. Rivers and Harbors Act of 1899 (§10, 33 U.S.C. 403) prohibits the unauthorized construction or alteration of any navigable water, the excavation from or deposition of material in such waters, or the accomplishment of any other work affecting the course, location, condition or capacity of such waters unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of the Army. Technical assistance provided by the Seattle District of the Corps of Engineers has been useful in laying the foundation in the plan for potential location of structures in the estuary. While the public interest review required for each permit precludes the Corps from foreclosing options for permit applications, the GHEMP has gone to great length to take into consideration those items considered in a public interest review. Therefore, the plan can be expected to provide greater predictability to permit applicants. Projects which are inconsistent with the GHEMP (not including conditional activities or special projects) would be precluded from approval through the federal consistency provisions of the CZMA.

d. Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-666c). The purpose is to recognize the vital contribution of wildlife resources to the Nation, the increasing public interest and significance thereof, and to provide equal consideration to those resources with other features of water resource development programs through the effectual and harmonious planning, development, maintenance and coordination of wildlife conservation and rehabilitation. Both the U.S. Fish and Wildlife Service and the National Marine Fisheries Service have been actively involved in the planning process to ensure equal consideration of the fish and wildlife resources and to develop and evaluate alternative plans. The FWCA requires such agencies to first consult with State and Federal wildlife agencies with a view to ascertaining what project facilities, operations, or measures may be considered necessary by those agencies to mitigate and compensate for project occasioned losses to wildlife resources, as well as to enhance those resources. This input has substantially affected the design and development of the GHEMP.

e. Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531). The purpose of the ESA is to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in the act. All Federal departments and agencies must seek to conserve listed species and utilize their authorities in furtherance of the purposes of the act. As lead agency for purposes of this PEIS, the OCRM has consulted with both the NMFS and the F&WS in order to ensure compliance with the ESA. It was determined that no marine animals listed on the endangered or threatened species list would be adversely impacted. Formal Section 7 consultation, however, was required with the F&WS for the endangered American

peregrine falcon (F.p. anatum), the sitings of which have only recently established Grays Harbor as a significant habitat for the migrants which frequent the area. The Task Force modified the plan to comply with ESA requirements and obtained a non-jeopardy opinion from the F&WS (see appendix C).

f. The above mentioned laws have been critical in developing and shaping the GHEMP. Other applicable laws include:

(1). Archeological and Historic Preservation Act, as amended

(2). Clean Air Act, as amended

(3). Executive Order 11988, Floodplain Management

(4). Executive Order 11990, Protection of Wetlands

(5). National Environmental Policy Act, as amended

5. Upon successful completion of the NEPA process and plan adoption, the GHEMP and the actions taken to adopt and implement it should be in compliance to the maximum extent practicable with all Federal, State and local plans, policies and regulations. Local governments will have revised local plans, zoning ordinances, etc. in order to be consistent with the GHEMP. While the GHEMP will provide the major framework for the future management of the Grays Harbor Estuary, other laws and regulations will still be utilized in the decisionmaking process.

PART V: MISCELLANEOUS

A: LIST OF PREPARERS

NAME	EXPERTISE	DISCIPLINE	EXPERIENCE (Yrs)
		Office of Ocean & Coastal Resource Management	
Richard B. Mieremet (EIS Coordinator)	Environmental assessment & EIS preparation, CZM issues & program approval	B.S. Conservation & Resource Development M.S. Water Resources Mngt.	Natural Resources & Coastal Zone Management (10) Environmental assessment (8)
JoAnn Chandler	Environmental law & Administration	B.A. History J.D. Land Use, Environment, Public Interest	Coastal Zone Management (8)
Dr. Robert K. Kifer	Physical Sciences, Biological Sciences	B.S. Dairy Science, M.S. Biochemistry, Physiology	Coastal Zone Management (8) Environmental assessment (13)
H. Grant Dehart	Land Use Planning, Historic Preservation	B.A. Architecture M.A. City Planning & Architecture	Coastal Zone & Land Use Mangement (7) Environmental assessment (2)
Roy N. Arnold	Water resources planning Wetlands management	A.B., M.B.A., Masters of Regional Planning	Coastal Zone Management Planning Specialist (2)
Gina DeFerrari	Environmental assessment	B.S. Geology M.S. Marine Affairs	Coastal Zone Management Planning Specialist (3)
		Grays Harbor Regional Planning Commission	
Pat Dugan	Economic Development, Urban/Regional Planning	B.A. Political Science M.A.T. Geography	Urban/Regional Planning (10) Public Administration (2)
Janet Richardson	City/Urban Planning	B.A. Urban/Regional Planning	Urban Economic & Social Planning (15)
Tim Trohimovich	Land Use & Environmental Planning	B.A. Urban/Regional Planning	Urban/Regional Planning (5)

Consultants

Rollie Montagne
Gordon Davis

INTERAGENCY PROJECT REVIEW TEAM

The following individuals have provided assistance during EIS preparation by reviewing draft copies and providing additional information.

Seattle District of the U.S. Army Corps of Engineers

Dr. Fred Weinmann
John Malek

National Marine Fisheries Service

Charles K. Walters
Jackie Wyland

U.S. Fish & Wildlife Service

Ralph Boomer
Jeffrey Opdyke

U.S. Environmental Protection Agency

Ron Lee
Virginia Fox-Norse

Washington Department of Ecology

Don Peterson
Joe Williams

Other members of the Grays Harbor Estuary Task Force.

David Ortman, Friends of the Earth, provided the Citizen's Estuary Management Plan Alternative

Typing and Editorial Assistance

Richard Kelly
Denise Brown
Sheila Faulkner
Donald Hardy
Marian Mieremet

C: LIST OF AGENCIES, ORGANIZATIONS AND PERSONS TO WHOM COPIES OF THE STATEMENT ARE SENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation
Council on Environmental Quality
Department of Agriculture
  Forest Service
  Soil Conservation Service
Department of Commerce
Department of Defense
  Office of Assistant Secretary
  U.S. Air Force
  U.S. Army Corps of Engineers
Department of Energy
Department of Health & Human Services
Department of Housing & Urban Development
Department of the Interior (45 copies)
Department of Justice
Department of Labor
Department of Transportation
  Environmental Division
  U.S. Coast Guard
Environmental Protection Agency
  Office of Federal Activities
  Region X
Federal Emergency Management Agency
Federal Energy Regulatory Commission
General Services Administration
Marine Mammals Commission
Nuclear Regulatory Commission

CONGRESSIONAL REPRESENTATIVES

Honorable Henry Jackson
Honorable Slade Gorton
Honorable Don Bonker
Honorable Norman D. Dicks
Honorable Mike Lowry
Honorable Joel Pritchard
Honorable Al Swift

NATIONAL INTEREST GROUPS AND ORGANIZATIONS

AFL-CIO (Maritime Trades Department)
American Association of Port Authorities
American Bureau of Shipping
American Farm Bureau Federation
American Fisheries Society
American Gas Association

American Littoral Society
American Shore and Beach Preservation Association
American Society of Landscape Architects, Inc.
American Society of Planning Officials
American Waterways Operators
AMOCO Production Company
Atlantic Richfield Company
Boating Industry Association
Bureau of Marine Resources
Center for Law & Social Policy
Center for Urban Affairs
Center for Urban & Regional Planning
Chamber of Commerce of the United States
Chevron, USA
Cities Service Company
Conservation Foundation
Continental Oil Company
Council of State Planning Agencies
El Paso Company
Environmental Policy Center
Environmental Defense Fund, Inc.
Environmental Law Institute
EXXON Company, U.S.A.
Friends of the Earth
Gulf Oil Exploration & Production Company
Gulf Refining Company
Institute for the Human Environment
International Council for Bird Preservation
Interstate Natural Gas Association of America
Manomet Bird Observatory
Marathon Oil Company
Marine Technology Society
Mobile Oil Corporation
Murphy Oil Company
National Association of Conservation Districts
National Association of Home Builders
National Audubon Society
National Marine Manufacturers Association
National Coalition for Marine Conservation, Inc.
National Farmers Union
National Fisheries Institute
National Forest Products Association
National Ocean Industries Association
National Recreation and Park Association
National Research Council
National Society of Professional Engineers
National Wildlife Federation
National Waterways Conference
Natural Resources Defense Council
Nature Conservancy
New York Zoological Society
Outboard Marine Corporation
Sierra Club
Soil Conservation Society of America

Standard Oil Company of Ohio
Sun Company, Inc.
Ecology & Environment, Inc.
Tenneco Oil Company
Texaco, Inc.
Union Oil Company of California
United Mobile Sport Fisherman
Urban Research & Development Association, Inc.
Western Oil & Gas Association
Wildlife Management Institute
World Wildlife Fund

STATE AGENCIES

Office of the Governor
Department of Commerce & Economic Development
Department of Ecology
Department of Fisheries
Department of Game
Department of Natural Resources
Department of Parks and Recreation Commission
Department of Transportation
State Conservationist
State Planning and Community Affairs Agency
Interagency Committee for Outdoor Recreation
Office of Archeology & Historic Preservation

LOCAL GOVERNMENTS

Mayors and Officials of the Cities of:
- Aberdeen
- Cosmopolis
- Hoquiam
- Montesano
- Ocean Shores
- Westport

MEMBERS OF THE GRAYS HARBOR ESTUARY TASK FORCE

LIBRARY INFORMATION CENTERS

Aberdeen Public Library
Cosmopolis Public Library
Evergreen State College Library
Grays Harbor Community College Library
Hoquiam Public Library
Montesano Public Library
Ocean Shores Public Library
Seattle Public Library
University of Washington Library
Westport Public Library

NEWS MEDIA

Daily World
Twin Harbors Press
Grays Harbor Suburbanite & Farmer-Logger
North Beach Beacon
Seattle Times
Tacoma News Tribune
Seattle Post-Intelligencer
Montesano Vidette

OTHER INTERESTED PARTIES

In addition to the above, OCRM will distribute some additional 600 copies to individuals and organizations who have either requested a copy of the DEIS, who commented during the scoping process, or who are generally interested in activities occuring in Grays Harbor and have been identified from Seattle District Army Corps of Engineers mailing list or the Grays Harbor Regional Planning Commission's mailing list.

A limited number of additional copies of the PDEIS will be available through the Grays Harbor Regional Planning Commission or OCRM. Contacts follow:

Grays Harbor Regional Planning Commission
2109 Sumner Ave.
Suite 202
Aberdeen, WA 98520
(206) 532-8812

NEPA Compliance Coordinator
N/ORM4
3300 Whitehaven St., N.W.
Washington, D.C. 20235
(202) 634-4120

Grays Harbor Estuary Management Plan

Grays Harbor, Washington
February 1983

Grays Harbor Regional Planning Commission
Wilsey & Ham

The preparation of this report was financially aided through a grant from the Washington State Department of Ecology with funds obtained from the National Oceanic and Atmospheric Administration, and appropriated for Section 306 of the Coastal Zone Management Act of 1980.

PARTICIPATING AGENCIES
ON THE
GRAYS HARBOR ESTUARY MANAGEMENT
PLANNING TASK FORCE

Grays Harbor County

City of Aberdeen

City of Cosmopolis

City of Hoquiam

City of Ocean Shores

City of Westport

Port of Grays Harbor

Grays Harbor Regional Planning Commission

Washington State Department of Ecology

Washington State Department of Fisheries

Washington State Department of Game

Washington State Department of Natural Resources

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

National Marine Fisheries Service

TABLE OF CONTENTS PAGE

INTRODUCTION

Why the Plan? 1
The Plan Area 2
The Planning Process 2
Plan Concepts 3
Relationship to Other Plans 3
Relationship to State and Federal Permitting Processes 4
How to Use this Plan 6
Plan Review and Amendment 9
Future Actions 12

PLAN CONCEPTS AND DEFINITIONS

The Planning/Management Framework 13
Estuary Management Goal 13
Planning Areas 13
Management Units 14
Definitions 14
Management Units 14
Fills 16
Terms 16

GENERAL POLICIES

Management Categories 22
Bankline Erosion Control 22
Bankline Straightening 24
Standard Uses 25
Log Rafting 26
Mitigation 26
Disposal of Wood Waste 28

PLANNING AREAS - DESCRIPTIONS AND GUIDELINES
Planning Area I 29
Planning Area II 31
Planning Area III 34
Planning Area IV 36
Planning Area V 38
Planning Area VI 40
Planning Area VII 43
Planning Area VIII 45

MANAGEMENT UNITS
Management Units 1 - 44 48

STANDARD USES 109

INTRODUCTION

WHY THE PLAN?

Grays Harbor is one of two major estuaries on the Washington coast and is the only coastal estuary in the state with an authorized deep water navigation channel and major port. The Grays Harbor estuary provides an important transportation linkage between local, national and international markets and serves as a focal point for the regional economy. In addition, the estuary is a nursery ground and passage way for a vast array of living resources and an important link in the migratory patterns of many fish and wildlife species.

Each year an increasing number of demands are placed on the estuary by an expanding economic base and growing population. The ability of the estuary to accommodate these demands, remains constant or diminishes. The result is often conflict between the various groups that want to use the resources of the estuary and the agencies responsible for managing those resources.

The responsibility for making decisions about the use of the land and water resources of the Grays Harbor area falls to a wide variety of local, state and federal agencies. Each agency that has some authority uses a plan or written guidelines to make decisions on what may or may not be done. The cities and the county have comprehensive plans and Shoreline Master Programs; the Corps of Engineers, Environmental Protection Agency, State Departments of Game and Fisheries and other state and federal agencies each have their own regulations. In general, these agencies have prepared their plans and guidelines independently. The result is that the process for making decisions and getting things done is confusing, uncertain and often frustrating for the individuals involved.

In response to the increasing conflicts, the Grays Harbor Regional Planning Commission formed an Estuary Planning Task Force in late 1975. In September, 1976 the Task Force, through the Regional Commission and the Department of Ecology, received federal funds for the development of a Grays Harbor Estuary Management Plan. A consultant team was retained to assist the Task Force in the development of the plan.

The Grays Harbor Estuary Management Plan does not eliminate or modify any of the laws, regulations, or policies which govern the actions and decisions of local, state or federal agencies, but rather, improves their interpretation, interaction and implementation. In identifying the major legal authorities and concerns which may be called into play throughout the estuary, the plan attempts to meld these authorities and concerns into unified estuary-wide guidelines for both protection and development of the area's economic and natural resources. Since these guidelines have been developed by participating local, state and federal agencies and, in full recognition of legal and policy constraints on each, the plan will avoid piece-meal decisionmaking through the estuary. By the same token, activities which are not allowed by the Plan can expect non-concurrence by participating agencies.

THE PLAN AREA

The area covered within the management plan includes the Grays Harbor estuary area from the end of the harbor entrance jettys, up Chehalis River to its junction with Wynoochee River, south of Montesano. The specific study boundary is defined in the description of each management unit.

THE PLANNING PROCESS

A five-step planning process was used in the development of the management plan.

Step 1

This initial stage of the planning process included the preparation of a comprehensive estuary information base. A technical team, composed of resource specialists, planners, economists and other technical personnel, was drawn from industry and local, state and federal agencies to assist the consultant team in the development of this information base. The completed data are in the form of thirteen large scale maps and a technical document entitled, Grays Harbor Estuary Management Program, Technical Memoranda, Summary of Interviews, and Annotated Bibliography. These documents are maintained at the offices of the Grays Harbor Regional Planning Commission. The information contained on the maps and in the technical document are:

- hydrology and floodplain
- jurisdictions and boundaries
- land and water transportation
- land ownership
- existing uses
- historical features
- soils and sediments
- fisheries
- natural resource use
- major utilities
- comprehensive plan designations
- shoreline types
- vegetation and wildlife
- areas of conflict and concern

Beginning with the Step 1 work effort, a major public information and communication program was undertaken. The program focused on three primary groups including: 1) the general public within the Grays Harbor region, 2) organized groups and individuals with an interest in the harbor, and 3) specific affected individuals. To reach these groups, a program of media contact and solicitation was undertaken; a sequence of general mailings established at various phases of the work; several thousand copies of a special "Community Information Bulletin" were prepared and distributed; and in-depth, hour long interviews were conducted with 68 individuals representing environmental groups, navigation interests, recreation interests, university and research groups, the fishing industry, local business organizations, specific local industries, labor, and the general citizenry. The thirteen maps are contained in the Federal Environmental Impact Statement that has been prepared on this plan.

Step 2

Through a series of six, one and two day workshops, the Estuary Planning Task Force evolved the management plan. The Task Force operated on a concensus basis under the guidance of the consultant team to discuss key issues, evaluate alternative courses of action and arrive at critical decisions. At the completion of the last workshop, the consultant team prepared a first draft of the management plan.

Step 3

This stage of the planning process involved a lengthy review of the Preliminary Draft Plan by the general public and the various agencies and jurisdictions represented on the Task Force. On the basis of that review, which included a public hearing conducted by the Grays Harbor Regional Planning Commission, a revised draft plan was prepared and published in November, 1978. As with the initial draft plan, extensive public and agency review has been conducted on this second draft. While some delay occurred in this review because of changing federal guidelines that had direct bearing on the plan, the completion of this step resulted in a revised public draft in early 1981.

Step 4

Based on public and agency comments received formally and informally by the consultant team, a proposed set of changes to the November draft was presented to the Estuary Task Force in a two day workshop. Based on the directions of the Task Force, a final revised public review plan was prepared and forwarded to the Grays Harbor Regional Planning Commission for their review and transmittal to the member jurisdictions and the affected state and federal agencies.

Step 5

This step is the formal process that each agency and local government must go through including public hearings, to officially adopt or endorse the plan. For local government, this involves adoption of the applicable provisions of the plan as a revised or amended local Shoreline Master Program. State and federal agencies will participate in the development of a state (SEPA) and federal (NEPA) environmental impact statement for this plan and will develop memoranda of agreement or other documents to describe their use of the Plan.

PLAN CONCEPTS

There are two important concepts that are the basis for the plan. First, the plan contains management goals, guidelines and policies as well as agreements on specific issues or projects within the Plan Area. The distinction is important since the normal process for developing this type of plan begins and ends with the establishment of goals and policies. However, because of the lack of agreement that has arisen in recent years on specific issues within the Grays Harbor region, it is not possible to develop goals and policies without understanding the effect of the policies on those issues. In many cases, the resolution of specific issues paralleled the development of policies for the area within which the issue existed.

The second concept of the plan is "balance". The Estuary Management Goal states that the estuary as a whole will be managed for multiple uses. Inherent in this goal is the idea of balance - the plan specifies goals, policies and guidelines which strike the tenuous balance between necessary and appropriate development of the harbor and protection and preservation of the estuary's natural resources. The plan looks at this balance on an estuary-wide rather than a piecemeal basis. Thus, some areas of the estuary are primarily devoted to the preservation of fish, wildlife and plant resources, free from the pressures of development. Still other areas are approved for certain types of development only, allowing both development and natural resources to co-exist.

Although the plan has been carefully balanced in this manner, this does not mean that it cannot be amended or revised. In fact, in a later section entitled Plan Review and Amendment specific procedures are outlined for amendment processes. Perhaps the most important consideration for plan amendment or revision is its effect on the balance of the plan. Future changes, whether in policy or specific issues, will be evaluated to ensure that the balance of the plan is maintained. Such changes must either be accommodated within the existing balance of the plan, or must be combined with actions which will re-establish that balance.

RELATIONSHIP TO OTHER PLANS

The Estuary Management Plan is being prepared by the Grays Harbor Regional Planning Commission. The Commission itself, however, does not have the authority to adopt or enforce any plan since it is strictly a planning and coordinating agency. The Estuary Management Plan represents a recommendation from the Estuary Planning Task Force, which was formed under the auspices of the Regional Commission, to the Commission members (local cities and county) as well as to the affected state and federal agencies.

To use the plan, each state and federal agency and local government will incorporate the applicable portions of the plan into their policies and review criteria and processes as well as into local Shoreline Master Programs and comprehensive plans. After adoption into local plans, the State Department of Ecology will incorporate the plan into the state's Coastal Zone Management program. In areas where management unit boundaries fall outside the jurisdiction of local Shoreline Master Programs, local comprehensive plans and zoning designations will be used to implement the plan.

RELATIONSHIP TO LOCAL, STATE AND FEDERAL PERMITTING PROCESSES

Most local, state and federal agencies with management authority in the estuary exercise their authority through either the issuance of permits or through review and comment on permit requests. As previously noted, the plan does not eliminate or modify these authorities, but does improve the predictability of these permitting processes through advance consideration and evaluation on an estuary-wide basis.

Perhaps the most significant permitting processes affecting the estuary and its wetland areas are those under the responsibility of the Corps of Engineers. Under the Rivers and Harbors Act of 1899, the Corps must determine whether work in navigable waters of the United States may be allowed (Section 10 permits). Additionally, under the Clean Water Act, the Corps must determine whether filling of waters of the United States, including wetlands, may be allowed (Section 404 permits). While administered by the Corps, Section 404 permit requests are evaluated with guidelines developed by the Environmental Protection Agency (404 Guidelines) and are subject to review and concurrence by the EPA and other federal agencies. In addition, in issuing both Section 10 and 404 permits, the Corps must solicit comments from state and federal fish and wildlife agencies and must assure that equal consideration is given to the protection of fish and wildlife resources along with other project purposes. These latter requirements are based on 404 Guidelines, the Fish and Wildlife Coordination Act, the National Environmental Policy Act, and various state statutes.

Just as the plan does not bypass the Corps permitting process, or any other local, state or federal permitting process, neither does the plan circumvent any of the criteria which an agency must use in issuing or commenting on a permit. The advantage of the plan, however, is that it brings increased predictability into these permitting processes because of the direct involvement of the permitting and reviewing agencies in the planning process. Whenever possible and appropriate, the planning process, including these agencies, has attempted to look ahead to permit criteria to the extent of the available data, in establishing the goals, policies and standards for this plan. For purposes of clarity, Management Unit descriptions specify where and to what extent these advance evaluations have been conducted. Where a proposed use or activity has not been permitted (or is considered conditional by the Plan and is denied through a local and/or State review process), a local Shoreline Permit will be denied and therefore if a Corps of Engineers permit is required, it will also be denied. A proposed use or activity is not permitted by the Plan if 1) it is not designated "permitted" in either the Permitted Activities table for each Management Unit or the Standard Use table and/or, 2) it is designated as "conditional" but denied through the review process conducted by local government or the State Department of Ecology.

As a more specific example, Section 404 Guidelines, which control requests to fill in waters and wetlands, require that a permit applicant make four demonstrations. These are: 1) that the activity associated with the fill is either water dependent, or there is no practicable site or construction alternative for the activity; 2) that there is a need for the proposed activity; 3) that there are no less environmentally damaging alternatives; and 4) that there are not unacceptable adverse impacts to the aquatic ecosystem from the fill and the activity associated with it.

In the broadest sense, the alternatives and needs demonstrations required of a permit applicant under Section 404 Guidelines have been evaluated under the plan, on an estuary-wide basis. In many cases, more specific aspects of these criteria were reviewed as a part of the decision making for this plan. However, many aspects of the first three criteria (including the needs and alternatives evaluations) are most directly associated with the specific project and its characteristics. To fully satisfy these three criteria under the Section 404 permit process will require evaluations related primarily to a specific project and its area of impact.

It is in the fourth area - unacceptable impact evaluation - that the plan has its greatest value, and the permitting process has its greatest stumbling block. The plan indicates

where proposed activities would generally be "acceptable", provided that avoidable adverse impacts are controlled (e.g., in the scope and design of the proposed activity). Simply, the acceptability of some site-specific adverse impacts is contained in the estuary-wide resource protection of the plan.

HOW TO USE THIS PLAN

This plan does not answer all questions on what can or cannot be done with a specific piece of land. As some of the previous sections have described, this plan does not take away the authority of existing regulations or policies, nor does it remove any decision making responsibility. The plan is designed to provide guidance to the decision making process, it does not make decisions itself.

The issues surrounding any proposed use or activity in an estuary are complex. The decision on such a proposal is therefore rarely based on a simple "right or wrong", or "good or bad" evaluation. Because of this, it is not possible to simply go, as an example, to page 38 to find out "the right answer" to the question of a specific permitted use. This plan contains several different forms of guidance which all must be considered to determine what is "right". Both the individual property owner who is considering a specific proposal and the decision maker who is evaluating the proposal, must use all of the guidance of this plan to make their final judgement.

There is no single way to properly use this plan since the most effective way would be to understand the entire plan. However, the following steps represent a general sequence to be used to determine whether or not a specific use or activity is considered by the plan as appropriate.

STEP 1

Locate the property in question on the Estuary Management Plan map. Two things should be noted from the map; first, the Management Unit number; second the Planning Area number.

STEP 2

The proposed use or activity must be accurately described. To do so, several questions should be asked:

1. Which of the uses identified on the "Standard Uses" table on page 109 most accurately describe the proposal?

2. Will any of the following activities be be required to accomplish the proposal? If so, which ones?

   Permitted Activities

   Structures
   - o Piers, docks, wharves
   - o Piling and mooring dolphins
   - o Bridges

- Causeways
- Outfalls
- Cable/pipeline crossing
- Boathouses
- Breakwater

Bankline Activities
- Diking
- Bulkheading
- Groins
- Jetty
- Special project fills (see page 16)
- Bankling straightening (see page 24)
- Bankline erosion control (see page 24)

Channel (Navigation) Activities
- New access channel
- Maintenance of existing channels or berths
- Realignment of existing channel

3. Will any part of the proposed use or activity extend waterward of the line of Ordinary High Water?

   If the answer to this question is yes, in addition to the Management Unit number identified in STEP 1, note that Management Unit 44 (dealing exclusively with the water area) will also apply to the proposal.

4. Will any part of the proposed use or activity extend waterward of the line of non-aquatic vegetation (into the wetlands)?

   NOTE: This line will not be easy to identify without technical assistance. While the line generally describes marsh areas, the seasonal nature of these areas and the broad definition of non-aquatic vegetation types make it difficult to accurately identify the extent of these areas. The Regional Planning Commission, city or county staff can provide some preliminary guidance on this question.

   If the answer to this question is yes, the proposal will be subject to the Corps of Engineers Section 404 permit requirements. Other permits may also be required depending on the specific type of proposal. This plan does not try to identify those additional requirements, but again, the Regional Planning Commission, city or county staff should be consulted for any of those possible other permits or procedures.

STEP 3

Turn to the page that covers the identified Management Unit (pages 48-108). On that page, you will find the following information about that management unit:

1. Planning Area Number

   This number (roman numeral) occurs directly under the Management Unit number. This refers to the Planning Area within which this management unit occurs (occasionally a management unit occurs in two Planning Areas). General Guidelines for the Planning Area can be found on pages 29-47.

2. Management Category

   Pages 22 and 23 will provide a general definition of these categories.

3. Boundary Description

   This is a series of statements that attempt to fix the boundaries of the management unit as accurately as possible.

   NOTE: The waterward boundary of a shoreline management unit is generally the line of Ordinary High Water. In some cases, the waterward boundary has been modified and is thereby described in this section.

4. Management Objective

   This is a statement about the general objectives for the management of this specific area. This should be considered a refinement of the Management Category definition for this management unit.

5. Permitted Activities Table

   A table that describes the permitted activities for this specific management unit (definitions of permitted and conditional are found on pages 17 and 19).

6. Standard Uses

   This is only a reference to the Standard Uses table on page 109.

7. Special Conditions

   Not all management units contain this section. For those that do, this section provides further guidance than can be found in the Permitted Activities or Standard Uses tables or within other guidelines.

If it is determined that the proposal involves Management Unit 44 (STEP 2, question 3), turn also to the page corresponding to that management unit.

STEP 4

Conduct an initial evaluation of the proposal in the following sequence:

1. Turn to the Standard Uses table (page 109);

2. Find the use (barge, berthing, aquaculture, etc.) that best fits the proposal;

3. Find the column with the applicable Management Category (UR, CM, etc.) for your Management Unit;

4. Identify whether the use is (●) PERMITTED, (□) subject to SPECIFIC MANAGEMENT UNIT GUIDELINES, or (no symbol) NOT PERMITTED.

   USE is Permitted, or subject to Specific Management Unit Guidelines:

   Turn to the Management Unit page and determine whether or not the activities (piers, diking, etc.) that will be required are permitted.

   USE is not Permitted:

   When a proposal does not conform to the plan, the requested permit will be denied by the permitting agency. If the proposal is still desired, however, it must first be presented as a proposed amendment to the plan (see Plan Review and Amendment section, pages 9-12).

   ACTIVITIES are not Permitted, Conditional, or subject to Special Conditions:

   The proposal does not conform to the plan (even though the use might be permitted) and will require an amendment to the plan (see Plan Review and Amendment section, pages 9-12).

   USE and ACTIVITIES are Permitted or subject to Special Conditions:

   Check the Special Conditions section of the Management Unit for any applicable provisions.

   USE or ACTIVITIES are Conditional:

   The proposal will be reviewed on the basis of its specific merits rather than on its general use or activity characteristics. Review the definition of Conditional Use (page 17) and develop a presentation to support the proposal based on its specific, unique characteristics and on its conformance to the Estuary Management Goal (see page 13), the applicable Planning Area Guidelines (pages 29-47), the Management Unit Objective and other relevant factors.

PLAN REVIEW AND AMENDMENT

The Estuary Planning Task Force, through its consensus decisionmaking process, will continue to play an important role in both on-going planning and plan review and amendment. This continuing role is necessary in order to maintain the balance of the plan through the consensus process. Both consensus and balance must be maintained if the plan is to serve as an effective guide to local, state and federal decisionmaking. A change in the balance of the plan (even through a change in a single Management Unit) could jeopardize the responsiveness of the plan to agency and citizen concerns, imparing the

advance permit evaluations that are contained in the plan and undermine the commitment of Task Force members to use the plan. The review and amendment process includes the following elements:

- **Annual Review**

In February of each year, the Estuary Planning Task Force will meet in a day-long session to conduct an Annual Review of the Estuary Management Plan. The primary purpose of this session is to review development and permit activities of the previous year and to assess the usability of the Management Plan. The Task Force may wish to suggest amendments to various portions of the Management Plan although the nature of those amendments will be more administrative or for the purpose of clarification than substantive policy changes. As with all of its reviews, the Task Force will ensure that comments from the general public are solicited and reviewed.

- **Five Year Review**

In February of the fifth year after the adoption or endorsement of the initial Management Plan, the Estuary Planning Task Force will meet in a series of workshops to systematically review all of the elements of the plan. On the basis of that review, both administrative and substantive changes will be recommended through the Regional Planning Commission to the respective Task Force jurisdictions, agencies, and the general public.

- **Plan Amendment**

The plan amendment process is guided by the adoption, implementation and amendment process of the State's Shoreline Management Program. Initially, this plan will be adopted by each local jurisdiction as an amendment to their Shoreline Master Program. Once done, the State Shoreline Management Program will be amended to incorporate the amended local Shoreline Master Programs.

Although the Estuary Planning Task Force is not legally a part of this adoption/amendment process because of its planning advisory role, it has, nonetheless, been the means to create the plan through the consensus of its members. Since state and federal agencies have worked with local officials on the Task Force to develop the plan, their early involvement in amendments to the plan will facilitate subsequent permits that might be required because of the amendment.

Through the annual and five year review process, the Task Force will be forwarding recommendations to local government for possible amendments to various components of the Estuary Management Plan and their Shoreline Master Programs. Such amendments will follow the same process as the adoption/amendment process of the initial Estuary Management Plan.

It is probable that individuals, corporations or special interest groups may wish to propose amendments to local Shoreline Master Programs and thereby the Estuary Management Plan.

Again, such amendments are only within the jurisdiction of local government although the Estuary Planning Task Force will have an interest in such amendments since they will effect other areas of the estuary. The role of the Task Force in such proposed amendments will be that of "review and comment" to the local government involved. To ensure that the Task Force or its individual members are able to provide meaningful

comment on such amendments, local government should consider limiting the consideration of plan amendments to once every six months. The following general procedure will be followed.

1. When a local government receives a request for an amendment to their Shoreline Master Program, that request will be forwarded along with explanatory materials to the Grays Harbor Regional Planning Commission.

2. Commission staff will forward the request to the members of the Estuary Planning Task Force.

3. The Task Force members will be polled to determine if the proposed amendment should require a special Task Force meeting outside the established annual review.

4. If no meeting is believed necessary, individual Task Force member comments will be forwarded directly to the local government.

5. If a meeting is believed necessary, the Task Force recommendation from that meeting will be forwarded to the local jurisdiction. Normally, such recommendations will be forwarded within 60 days from the time the Regional Planning Commission received the request.

In conducting a review of the proposed plan amendment, the Task Force, through its consensus decisionmaking process, will develop its recommendation to the local jurisdiction based on a consideration of the following criteria. Applications, therefore, should address themselves to these factors:

1. The conformity of the amendment with the Estuary Management Goal, the applicable Planning Area Guidelines, and other Plan objectives and policies;

2. A demonstration that the amendment is not already permitted elsewhere in the estuary or that other permitted locations are not suitable (land ownership is insufficient as a sole factor in determining suitability);

3. A demonstration that the amendment:

   a. will not cause adverse effects on the local and estuarine natural systems or that these effects can be mitigated, and
   b. will be within the ability of local and regional support systems (rail, utilities, highways, etc.) to serve the proposed amendment,

4. Specific factors to be considered in a proposed plan amendment include an evaluation of short and long term, primary and secondary:

   a. changes in land use patterns,
   b. changes in energy supply and demands,
   c. increased pressures for development in floodplains, streams and natural drainage ways, wetlands or other aquatic areas,
   d. significant changes in air, noise or water quality levels, or potential violations of established standards,
   e. significant changes in surface or groundwater hydrology,
   f. pressures for encroachment on fish or wildlife habitat;

5. Additional factors include the degree to which an amendment would:

   a. set a precedent for other comparable amendments,
   b. result in or promote a significant cumulative adverse impact, and
   c. affect significant historic, archaeological, pre-historic or scientific areas or facilities.

In addition, any amendment to local Shoreline Master Programs must include satisfaction of environmental requirements that result from an evaluation of the State Environmental Policy Act and the National Environmental Policy Act as appropriate. Once approved by a local jurisdiction, the amended Shoreline Master Program must be forwarded to the State Department of Ecology for approval.

FUTURE ACTIONS

Even though this plan has developed a comprehensive management framework for the entire estuary, it has not been possible to develop all of the planning tools that are needed to deal with all issues. For that reason, the following additional actions are necessary.

1. Preparation of a Mitigation Plan for the estuary identified in the Mitigation Section (Pages 26 and 27).

2. Preparation of a Dredged Materials Disposal Plan for the estuary to designate acceptable disposal sites and options to accommodate dredging needs for at least a 20-year period.

PLAN CONCEPTS AND DEFINITIONS

THE PLANNING/MANAGEMENT FRAMEWORK

The planning and decisionmaking framework of the Estuary Management Plan is contained within a concept of descending levels of policies. The concept recognizes that one set of policies applied to the entire estuary cannot provide the type of guidance to individual property owners nor government in making decisions on permitting uses or activities on specific sites. Yet to develop policies only at the site-specific level fails to recognize the implications of those policies to the total estuary. Policies, therefore, must begin with the total estuary and end with site-specific guidelines. Each level of policy and the size of the area to which those policies are applied, is more specific than the preceding level.

Estuary Management Goal

In the Grays Harbor Estuary Management Plan, three levels of policies are established. The first level is a single, broad policy called the Estuary Management Goal. The core of this goal is the concept of balance in the development and preservation of the estuary as a whole (see also section entitled Plan Concepts). The Goal, which says that "the Grays Harbor estuary will be managed for multiple uses" is, of course, very general, and is not a yardstick which can be used to assess a specific project proposal. Instead, specific project proposals must be evaluated by looking at the more detailed policies at the second and third levels of the planning/management framework.

Planning Areas

The second policy level contained in the Grays Harbor Estuary Management Plan is the Planning Area. The estuary has been divided into eight Planning Areas (see Estuary Management Plan Map), each representing a common set of natural and man-related features. The criteria that were used to establish the boundaries for the Planning Areas include:

- land ownership
- political jurisdictions
- existing uses
- areas of existing or possible conflict
- physical boundaries or features

Planning Areas provide a basis for describing how different areas of the estuary presently function and how they might function in the future. Each Planning Area is described in terms of its existing character, its major committed uses, its conflicts and assets. General guidelines are established for each Planning Area on the management of the Planning Area's natural resources and on development within the Planning Area.

Management Units

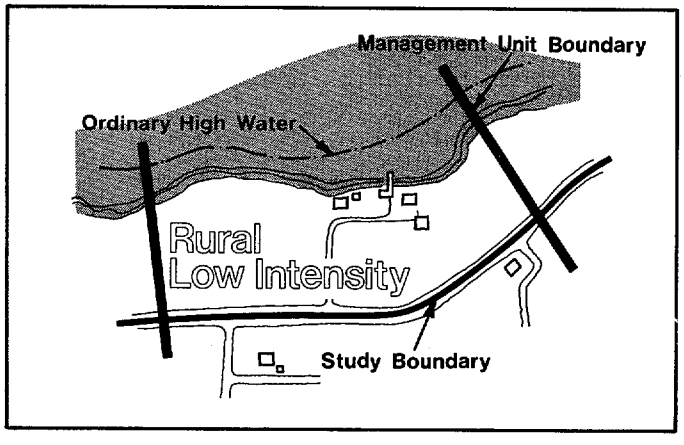
The third policy level in the management plan is the Management Unit. This is the most specific policy level and is designed to provide guidance to property owners and government in evaluating project proposals. Forty-three Management Units are contained in the Estuary Management Plan (see Plan Map). Each unit is given a Management Category (defined on pages 22 to 23) which carries with it a set of Standard Uses (page 109). The boundaries of each unit are described along with the Permitted Activities and a general Management Objective. Some Management Units also contain a set of Special Conditions that relate to that unit only.

DEFINITIONS

Management Units

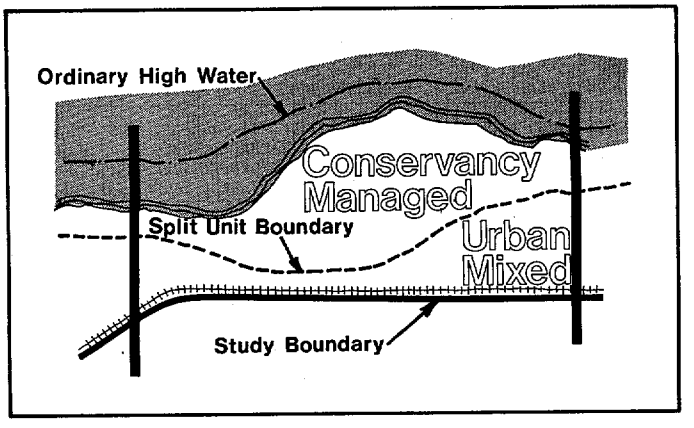
o Management Unit Boundaries

Most management units run generally parallel to the shoreline. They are defined on the upland side by the Study Boundary; on the water side by the line of Ordinary High Water; and on the third and fourth sides by boundaries established whenever possible, by specific ground or other property features. The diagram below is a further illustration of the basic management unit boundaries.



- Split Management Units

The plan has a number of management units that have critical wetland values shoreward of the line of Ordinary High Water. In these units, additional protection is afforded the wetlands through the split managment unit concept. The management units have been split with a third line parallel to the shoreline. Most often, the Corps of Engineers line of nonaquatic vegetation (Section 404 line) is used to split a management unit although occasionally other features are used. Splitting these management units has been done to add special emphasis to their management philosophy and objectives. The split line separates areas with distinctly different characteristics. In such cases, each split portion of the management unit has its own management designation.



- In-Water Management Units

While most management units are defined by the line of Ordinary High Water, some units are tidelands and submerged lands generally within the water area of the estuary. In these cases, the boundaries of the management units are not exact but are described by the features that are receiving special management treatment. As an example, the Whitcomb Flats area is designated as Management Unit 42. There is no attempt to precisely define the boundaries of that management unit except as it is generally outlined on the Management Unit Map.

- Management Unit 44

Management Unit 44 is a special unit that includes all the water area not included within any other designated management unit.

- Special Management Units

Several management units have been given a "Special" classification. This indication is designed to be used where non-standard conditions exist either in the unit's boundary definition or where other special circumstances are present. In all cases, the unique circumstances are covered in a Special Conditions section of the management unit description.

Fills

Erosion Control

This type of fill is designed to preserve the existing bankline or to protect the bankline from erosion. This fill type is contained in the Bankline Erosion Control Policy. This policy may only be used where specifically authorized within the Permitted Activities Table of each management unit.

Special Project Fills

This type of fill is included within the special conditions of specific management units to deal with specific projects or sites. The fills in Management Unit 12 are an example of this type of fill. The exact conditions of these fills are spelled out within specific management units and have been determined through the estuary planning process.

Bankline Straightening

This is a small fill primarily done for the purpose of straightening the bankline to create more usable uplands for development. Within the estuary planning process it is not possible to identify all such possible circumstances where this type of fill might be desired so a Bankline Straightening policy has been developed. Like Bankline Erosion Control, this policy may only be used where specifically authorized within the Permitted Activities Table of each management unit.

All other fills that do not fit the preceeding definitions will be disallowed through the permit process. The term fill, as used in this plan, does not include fills which are needed to prepare upland sites above the jurisdiction of the Section 404 line of non-aquatic vegetation. See also, section on Disposal of Wood Waste.

Terms

Many of the definitions in the following material contain terms or phrases that are somewhat technical in nature, but which conform to specific language contained in various statutes or regulations. Specific questions relating to some of these terms should be addressed to the Grays Harbor Regional Planning Commission staff or the state Department of Ecology or Corps of Engineers.

Access Channel:	Creation of a side channel connecting the main navigation with shoreside facilities including ship berthing.
Activities:	Any action taken either in conjunction with a use or to make a use possible. Activities do not in and of themselves result in a specific use. Several activities (for example; dredging, piling, fill) may be required for a single use.
Bankline:	That area of the shoreline that lies above ordinary high water and may be below the 404 boundary. The bankline can include wetland areas.
Bankline Erosion Control:	See Page 24

Bankline Straightening: See Page 24

Boathouse: A structure built over the water to house boats.

Breakwater: An offshore barrier, sometimes connected to the shore at one or both ends, to break the force of waves. A structure of rock, piling or concrete to protect a shore area, harbor or basin.

Bridge: An overwater structural crossing for the purpose of vehicular, pedestrian and rail access.

Bulkhead: A structure that separates land from water by a vertical retaining wall. The bulkhead retains earth and prevents sliding as well as protects the upland against wave damage.

Cable and Pipeline Crossings: Lines and cables placed in the substrate of a waterway to traverse the waterway beneath the water.

Causeway: A filled passageway for vehicle access, often with culverts to allow drainage or tidal flow through the causeway.

Channel Maintenance: Dredging of shoal materials from an existing navigation channel to maintain access.

Channel Realignment: Dredging to relocate an existing navigation channel in the same waterway. Primarily done to increase safety of navigation, decrease maintenance or to shorten the total channel length.

Conditional Use: An activity or use which generally conforms to the management objectives of a particular Management Category or management unit, but because of potential problems inherent with the specific use or activity, may not be appropriate in every situation. Being "conditionally allowable" assumes that the use or activity is allowable only if sufficient care is taken to avoid predictable negative impacts through the application of project/site specific conditions.

Uses and activities classified as conditional may be authorized provided that all of the following criteria can be satisfied:

1. The proposed use or activity is consistent with the appropriate Planning Area Guidelines and the Management Objectives of the specific management unit. Consistency includes both the scope and scale of the proposed use or activity,

2. The proposed use of the site and design of the project will be compatible with other permitted uses and activities adjacent to and within the area,

3. The proposed use or activity will cause no unreasonably adverse effects to aquatic and shoreland areas,

4. The proposed use or activity will not have substantial adverse cumulative effects, and

5. There will be no substantial detrimental effects to the public's interest in the area, including normal public use of the shoreline.

Uses and activities which are authorized as conditional will be subject to conditions necessary to prevent any undesirable effects (including limitations to the scope and scale of the proposed use or activity).

A use or activity may be considered conditional, and thereby generally consistent with the plan goals, but may not be found permissible after a specific case review. Despite general consistency with the plan, a conditional use or activity may be inappropriate because of the specific circumstances surrounding the proposal or because of the unique characteristics of the proposal.

In the exceptional case where a proposed use or activity has not in any way been identified, classified or set forth in the plan, it may be proposed a conditional use or activity, but may only be authorized if the above criteria are met, and other applicable state and federal regulations (including permit requirements) are satisfied.

Dike: An earthen embankment or ridge constructed to restrain high waters.

Dock: A fixed or floating decked structure against which a boat may be berthed temporarily or indefinitely.

Dolphin: A group of piles driven close together in water and tied together so that the group is capable of withstanding lateral forces from vessels and other floating objects.

Dredging: Removal and relocation of materials from a waterway or its banks.

Fill: See page 16

404 Boundary: This is the upward limits of jurisdiction of Section 404 permit as required by the Corps of Engineers. This boundary is the line between uplands and wetlands. Detailed guidance for identifying the boundary is not presently available. Field surveys and vegetation sampling can establish the boundary (see also section on Relationship to Local, State and Federal Permitting, page 4).

Groin: A shore protection structure (usually perpendicular to the shoreline) to trap littoral drift or retard erosion of the shore.

Interim Uses: Interim use of a site would not result in the alteration of the site in a manner that would preclude future permanent use and would not involve significant capital investment in fixed facilities. In general, significant investments would involve costs that exceeded the cost of the land or would force the development of major facilities, not directly associated with the use but whose investment would be jeopardized if the use were discontinued (e.g. wastewater treatment plants, major roads, utilities, rail lines, etc.).

Jetty: An artificial barrier used to change the natural littoral drift to protect inlet entrances from clogging by excess sediment and to direct and confine the stream of tidal flow. Jetties are built at the mouth of a river or estuary to help deepen and stabilize a channel.

Mean Low Water (MLW): The average of all observed low tides over a 19-year period. The average is of both the lower low and of the higher low tides recorded each day over a specific time period.

Mean Lower Low Water (MLLW): The average height of the lower low tides observed over a 19-year interval. The datum plane is used on Pacific Coast nautical charts to reference soundings. This line appears as a dotted line on NOS (formerly C&GS) charts between tidelands and submerged lands.

Ordinary High Water (OHW): The same as mean high water. 1) the average height of the high waters (tides) over a 19-year period. All high waters are included in this area of diurnal tides, 2) this line is the boundary between uplands and tidelands and is shown as a solid dark line on NOS (formerly C&GS) charts. In the area near Aberdeen, OHW is 9.4 feet, at Westport 8.3 feet, at Montesano approximately 7.5 feet above mean lower low water.

Outfall: Discharge or point of discharge of a culvert or other closed conduit and may also include an open outfall structure for return water from dredge material disposal sites, cranberry bogs, etc.

Permitted Use: A use or activity that conforms to the Grays Harbor Estuary Management Plan and may be undertaken subject to:

- The general requirement that the use or activity be designed and constructed in a manner that will minimize, so far as practical, any resultant damage to both the natural resources of the affected aquatic and shoreland area, and maintain consistency with the intent of the goals, policies and standards of the plan,
- Specific policies, standards or special conditions contained in this plan, and
- Applicable local, state and federal permits and regulations.

Pier: A structure extending into the water from solid land for use as a landing place or promenade for persons and goods to and from vessels alongside the pier. Sometimes synonymous with wharf.

Piling: A long, slender stake or structural element of timber, concrete or steel which is driven, jetted, or otherwise embedded on and into the ground for the purpose of supporting a load.

Riprap: A facing layer of material placed on an embankment to prevent erosion, scour, or sloughing.

Unacceptable Adverse Impact/ Not Unacceptable Adverse Impact: An unacceptable adverse impact is one which will significantly affect the biological functions of the particular site or of the estuary as a whole. Whether impacts of a particular use or activity are unacceptable depends on a comprehensive analysis including the nature of the proposed use or activity and proposed protective and mitigative measures.

Where the Plan indicates that certain uses and activities will not have unacceptable adverse impacts, this determination is made based on current data and in the context of all of the impacts and protective measures contained in the Plan. The determination presupposes that measures will be adopted to control avoidable adverse impacts, that all special conditions will be satisfied, and that appropriate permit criteria will be met.

Uplands: Areas of shoreland characterized by plants that cannot withstand periodic or prolonged flooding or saturated soils. These areas do not support wetland vegetation and are outside Section 404 jurisdiction (see 404 Boundary definition).

Use: The "end" to which a land or water area is ultimately employed. A use often involves the placement of structures or facilities for industry, commerce, habitation or recreation. An accessory use is a use incidental and subordinate to the main use of the property and located on the same lot or parcel as the main use.

Vegetation: The general plant cover of an area as differentiated from individual types (species) of plants. Vegetation includes the numerical relationships of different species.

Water Area: That portion of the study area that lies below Ordinary High Water.

Water Dependent: A water dependent use or activity cannot exist in any other location and is dependent on a water location by reason of the intrinsic nature of its operations. The water location or access must be needed for:

- Water-borne Transportation - navigation, moorage, fueling and servicing of ships or boats, terminal and transfer facilities, resource and material receiving and shipping; or
- Public access; or
- A Source of Water - for facilities necessary for water withdrawal.

Water Related: A water related use or activity is not intrinsically dependent on a waterfront location. A use or activity is water related if:

- It provides goods or services that are directly associated with water dependent uses, such as supplying materials or services to or using products of water dependent uses; or

- It gains substantial cost savings or revenue-differentiating advantages (not associated with land cost or rents) from being located on the waterfront that it could not obtain from an inland location, or

- A location other than adjacent to the water would result in a public loss of quality in the goods and services offered, considering the economic, social and environmental consequences of the use.

Water related uses and activities are not differentiated from non-water dependent uses by federal regulations or guidelines. The application of federal regulations or guidelines to such uses will therefore be done as though they were non-water dependent.

Wetlands: The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevelance of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas (40CFR230, 24 December 1980).

By definition, wetlands are considered to be "waters of the United States", and are thereby within the jurisdiction of the Corps of Engineers to regulate the discharge of dredged or fill materials into those waters.

Wharf: A structure built alongside a waterway for the purposes of receipt, discharge and storage of goods and merchandise from boats.

GENERAL POLICIES

MANAGEMENT CATEGORIES

The final Department of Ecology Guidelines for the implementation of the State Shoreline Management Act, identify four "environment types" that would be used by local government in developing their local Shoreline Master Programs. Those four environments - natural, conservancy, rural and urban - have been expanded into eight management categories within the Grays Harbor Estuary Management Plan. The following paragraphs identify the management categories along with a general statement of their purpose.

N Natural

Purpose: The Natural management category is intended to preserve and/or restore designated natural areas to their natural or original condition. Such areas are designed to remain relatively free of human influence and have severe restrictions on the intensity and type of use that is allowed.

The primary determinant for designating an area as Natural is the actual presence of an important natural feature which is intolerant of intensive human use.

CN Conservancy Natural

Purpose: The Conservancy Natural management category is designed to be used to preserve and restore areas to their natural condition. Direct human influence in such areas will be minimal. The primary emphasis of Conservancy Natural is to ensure that future uses and changes that occur within the area are designed to enhance rather than degrade the natural characteristics of the area.

CM Conservancy Managed

Purpose: The Conservancy Managed management category classification is designed to protect areas for purposes that directly use or depend on natural systems. While it is not intended that such areas will be preserved in their natural state, the activities which occur in these areas should be compatible with the natural systems.

Managed is the key word in this classification. It is the intent of this classification to allow uses which depend on the natural ecological system for production of food for recreation, for recognized scientific research, or for public access for recreational uses. Recreation uses will be water dependent and designed to maintain the quality of the natural elements of the area.

RA Rural Agricultural

Purpose: The Rural Agricultural management category is intended to protect existing and potential agricultural land from the pressures of urban expansion and Rural-Low Intensity development. Agricultural uses include intensive cultivated practices that are dependent on regional, national and international markets and includes agricultural food crops as well as tree farming.

Residential development will be limited to one dwelling per 10 acres.

RL Rural Low Intensity

Purpose: The Rural Low Intensity management category is intended to be used to restrict intensive development along undeveloped banklines and maintain open spaces and opportunities for recreational uses that are compatible with a general rural character.

Agricultural uses are possible within the Rural Low Intensity category although it will relate more to local markets or individual subsistence farming.

Residential development within Rural Low Intensity areas will be limited to densities that do not exceed one dwelling per five acres.

UR Urban Residential

Purpose: The Urban Residential management category is intended to protect areas in which the predominant use is or should be residential. The Urban Residential category is designed to maintain or ensure the maintenance of a residential character in the development of a designated area in terms of density, scale and the general types of activities permitted.

Public water access and limited local service commercial uses are appropriate within Urban Residential areas.

UM Urban Mixed

Purpose: The Urban Mixed management category is to designate areas in which there is or should be a mix of compatible urban uses. In general, residential densities will be higher than those of rural areas; industrial and commercial uses will be service or community oriented; public access to the water area will be encouraged for recreation purposes.

UD Urban Development

Purpose: The Urban Development management category is intended to designate areas in which the predominant uses are or will be industrial and commercial development. The intent of the designation is to provide for efficient utilization of such areas primarily for water-dependent/water-related commerce and industry that are directly related to the region's basic economic sectors.

BANKLINE EROSION CONTROL

Within each management unit description, the Permitted Activities Table identifies where the following policies will be applied.

Activities permitted within these policies include riprapping and minor straightening and sloping of the bankline as required to stabilize upland areas and prevent accelerated erosion processes.

1. Materials to be used shall be of nonerodable quality that will allow long term stability and minimize maintenance.

2. Riprap/bank stabilization procedures shall be confined to those areas where active erosion is occurring or new development or redevelopment requires protection for maintaining the integrity of upland structures or facilities.

3. Only clean materials may be used. Materials which could create water quality problems or which will rapidly deteriorate are not permitted.

4. Minor modifications of the bankline may be permitted on a case-by-case basis. These alterations shall be for the purpose of stabilizing the bankline, not for the purpose of developing new upland areas.

5. Under no circumstances shall bankline erosion control be initiated for the purpose of gaining developable uplands from existing water areas.

6. All projects shall be constructed in a manner to minimize turbidity.

7. In all cases, restoration of the bankline through removal and prevention of debris and solid waste build-up will be encouraged.

8. The use of concrete slabs will not be permitted for bankline erosion control unless the concrete is broken into pieces no larger than 10 square feet in surface area and placed in a manner so as to preclude slumping and displacement. It is not the intent of this section to preclude the use of old concrete but rather to ensure that when used it will accomplish the same purpose and have the same qualities as natural material.

9. The outer slope of the bankline after completion of the erosion control will not exceed a slope of 2:1.

10. Use of vegetation for bankline stability is required where technically applicable and is encouraged in conjunction with structural forms of erosion control.

BANKLINE STRAIGHTENING

In specifically designated "urban" management units (identified in the Permitted Activities Table of the management unit), small fills may be allowed for the purpose of straightening the bankline to consolidate uplands for development.

In general, management units so designated have been found to represent the best alternative areas within the estuary for maximum and efficient utilization of the uplands and bankline for water dependent and water related uses. In these cases, consolidation of the upland areas through minor filling to straighten the bankline is seen as the means to promote efficient and effective use of the bankline areas. Where applied, the environmental impacts of such fills have not been found to be unacceptable, particularly in view of the broader objectives of the specific management units. In addition to the normal requirements for a federal Section 404 permit (see Relationship to Local, State and Federal Permitting), the following criteria will apply to instances where Bankline Straightening is permitted:

1. This policy will be applicable only in specified management units and as required in adjacent Management Unit 44.

2. Bankline straightening can only occur between two exisiting points of land as defined by the limit of Corps jurisdiction, and when complete, the new line of Corps jurisdiction will be a straight line connecting these two points of land.

3. The maximum permitted fill within this policy is two acres measured from the Line of Non-Aquatic Vegetation (Section 404) and includes the areas defined as wetlands and is measured to the toe of the fill.

4. Two or more fills permitted under this policy may not be accumulated at the same or a portion of the same site.

5. Any projection beyond the permitted fill must be by a structure.

6. The outer slope of the fill will not exceed a slope of 2:1. However, a greater slope may be permitted if conditions warrant and the design is approved by state and federal resource agencies.

7. Broken concrete of sizes not to exceed 10 square feet and placed in a manner so as to preclude slumping and displacement is permitted along the fill slope.

8. Materials to be used on the fill slope shall be of non-erodable quality that will allow long-term stability and minimize maintenance.

9. Only clean materials may be used for the fill and fill slope. Materials which could create water quality problems or which will rapidly deteriorate are not permitted.

10. All projects shall be constructed in a manner to minimize turbidity.

11. Use of vegetation for bankline stabilization is required where technically applicable and is encouraged in conjunction with structural forms of erosion control.

STANDARD USES

Each Management Category contains a set of Standard Uses that are either permitted, allowable by special conditions or are not permitted under the plan. Each management unit is assigned a management category which automatically brings with it a set of standard uses. The Standard Uses Table matches management categories with uses.

LOG RAFTING

Log rafting may be permitted in areas where it occurs on the map (see Map in the Appendix) provided that log grounding does not occur within those areas. If log grounding occurs, the log rafting may continue as a non-conforming use subject to the following conditions:

1. Any modification or replacement of existing structures or practices can only be approved if such modifications will result in a net reduction of the incidence of log grounding, and

2. If such log rafting is discontinued for a period of time exceeding one year, it will not be allowed to resume.

Expansion of log rafting into new areas can only be permitted if it is demonstrated that no grounding will occur, there will be no significant modification of the aquatic environment, excessive debris will not accumulate, and other environmental impacts are minimized. Special consideration will be given to such expansion if it will reduce the incidence of grounding at an existing area.

MITIGATION

As previously noted, balance is one of the important concepts of the plan. In developing the goals, policies and standards of the plan, the planning process established a balance between protecting the integrity of the natural systems and its resources, and allowing for the long term maintenance and development of the region's economic base. To a degree, that balance was achieved by allowing both objectives to be met within the total estuary, with the acceptance of some site-specific economic and resource impacts in return for opportunities for resource protection and economic development on an estuary-wide basis.

In striking the balance, the planning process also recognized that it could not foresee all possible circumstances and so allowed for changes through the plan amendment process (see also Plan Review and Amendment). Any amendment to the Plan must maintain its balance. In some instances, it is possible that a plan amendment might not be allowed because of its adverse effect on the balance of the Plan. In other instances, it may be possible to preserve the balance of the Plan through mitigation of adverse effects.

There are three mitigation concepts used in this plan. The first involves the creation, restoration or enhancement of an estuarine area to maintain the functional characteristics and processes of the estuary. The second is somewhat of a variation on the first where a creation, restoration or enhancement project involves multiple actions over time. The third involves the "banking of estuarine lands" for the permanent protection of their resources.

In mitigation actions to create, restore or enhance the estuary, the emphasis includes (but is not limited to) maintaining the natural biological productivity of the estuary; maintaining the diversity of species and habitats; maintaining the tidal prism; maintaining the quality of estuarine waters; and, maintaining the integrity of unique features within the estuary.

Mitigation projects involving multiple actions are generally large in size and/or dollar scope and may also involve actions that should be done over a relatively long period of time. In such cases, the project is initiated through one mitigation action and is continued with subsequent additional actions (e.g., the addition of more land, regrading a restoration area, cash payments to support continued mitigation actions, etc.) that result from other situations where mitigation is deemed necessary. While this is not truly a different form of mitigation, it is a different way to implement a creation, restoration or enhancement mitigation project. It has the advantage of allowing a very large resource project to be undertaken without a corresponding large development action. Additionally, very small mitigation requirements can be met without the necessity for a complete mitigation project.

Mitigation projects involving the banking of estuarine lands represent a different philosophic approach to mitigation. Whereas the first two forms of mitigation emphasize the replacement or enhancement of the estuary's biologic characteristics, this latter form of mitigation works to achieve permanent protection of the resource. In such actions, the emphasis is on lands immediately adjacent to development areas which may be subject to pressure for conversion to development uses; lands with high resource values; lands with unique resource characteristics; and, lands in resource scarce areas.

In choosing areas, sites or actions as possible mitigation projects for plan amendments or other changes that would upset the balance of this plan, the following priorities will be used:

Priority	Areas, Sites, Actions
	BIOLOGICAL MITIGATION
1	areas in general proximity to the proposed alteration,
2	other areas according to their similarity in characteristics to the proposed amendment area - characteristics include salinity regime, tidal exposure, substrate type, hydrology, solar orientation,
3	areas or resources which are presently in greatest scarcity compared to their past abundance and distribution,
	NON-BIOLOGICAL MITIGATION
4	areas directly related but indirectly connected to estuarine systems, and
5	estuarine land banking.

A local/state/federal mitigation team will prepare a Mitigation Plan for the Grays Harbor Estuary that will include a definition of potential mitigation projects that meet all three mitigation concepts. Prior to the completion of that plan, the mitigation team will define needed mitigation actions on a case-by-case basis.

Mitigation actions developed to address the balance of the Plan are not the only habitat restoration or improvement proposals which may be considered or implemented in the estuary. Additional actions to restore or improve fish and wildlife habitat (e.g., restoration of diked habitat, marsh creation) are possible, but should be reviewed and coordinated with mitigation actions under the Plan to assure that they are complementary.

DISPOSAL OF WOOD WASTE

Disposal of wood waste, and other solid waste material, in areas under the jurisdiction of the Shoreline Management Act is not permitted unless the primary purpose for creating the fill is for a use other than waste disposal. Proposals to use wood waste in combination with other fill material to create an upland development site may be permitted and will be evaluated on a case-by-case basis.

PLANNING AREAS
DESCRIPTIONS AND GUIDELINES

PLANNING AREA I

Area Description

- Predominant Character

The predominant character of Planning Area I is natural, with a major influence from the fresh water system of Chehalis River. It is an area of limited access and sparse development.

- Major Committed Uses

The predominant use of the planning area is for hunting and fishing as well as nonconsumptive resource use (wildlife observation). Secondary committed uses include the gravel extraction operations and agricultural areas in the upriver portions of the planning area.

- Major Existing or Potential Conflicts

No major conflicts exist within the planning area. Potential conflicts exist with industrial development pressures in the western portion behind the Junction City area and with possible development proposals for the many small parcels that exist in the area. Such proposals would conflict with the predominant character and use of the area. It is not believed that continued operation of the gravel extraction facility at its present location poses a major conflict.

- Planning Area Assets

The majority of the planning area is important as a water containment area. It operates as a storage area for flood waters from up-river areas as well as tidal surging. In accommodating this hydrologic function, it serves as a valuable area for water fowl nesting and for recreation hunting and observation. The river corridor is a necessary area for fish passage and rearing.

Planning Area Guidelines

<u>Management of the Natural Resource</u>

- Bankline

The bankline within Planning Area I will be maintained in its natural configuration except as specifically provided through other guidelines and policies.

- Water Area

The water surface area will remain in its present configuration or as allowed by other guidelines and policies.

- Water Quality and Hydraulics

Any alterations to this planning area should not detract from its ability to function as a water storage area. Existing high levels of water quality will be maintained.

- Fish and Wildlife

Fish and wildlife resources will be managed to maintain or enhance their present condition.

- Vegetation

Selective harvesting of timber resources will be allowed within the planning area. Such activities will not detract from other planning area guidelines and will adhere to accepted forest harvesting practices. All other vegetation including marsh areas will be maintained in their present condition.

- Aggregate Minerals

Aggregate resources have a long-term importance to the economy of the area. Aggregate extraction within the planning area will be allowed to continue within the guidelines of a reclamation plan and in accordance with practices that are consistent with other planning area guidelines.

Development Within the Planning Area

- Economic Base

The planning area provides indirect support to the local and regional economy through recreational hunting and fishing. Additionally, it provides secondary support to the commercial fisheries industry as a fish rearing area. These two roles are important to the Grays Harbor community and should be maintained. Both the eastern and western portions of the planning area provide limited opportunities for industrial or agricultural development. These should be considered transitional only to uses in adjacent planning areas and should not detract from the ability to achieve other planning area guidelines.

- Use Character

The general, natural unaltered character of the planning area should be maintained. Any deviation from that character should occur only at the eastern or western boundaries.

- Recreation

The current level of recreation use should be maintained with no general increases in use intensity. Limited additional pedestrian access may be possible but without supporting facilities (parking areas, roads, etc.).

- Resource Harvesting

Existing aggregate extraction along with selective timber harvesting will be allowed within the constraints of other planning area guidelines.

- Navigation

The river surface and supporting navigation channel are important to the regional economy. Continued maintenance of the channel at its present depth is consistent with the character of the planning area. Any dredging done in conjunction with the authorized channel shall be consistent with other planning area guidelines.

- Structures and Fills

In general, filling within the planning area is inconsistent with the character of the area and with other guidelines except for limited bankline maintenance. In-water structures are also inconsistent with the character and guidelines of the area except for limited personal boat docks. Upland filling and structures including regional public facilities, may be acceptable on a case-by-case basis provided they do not detract from other planning area guidelines.

PLANNING AREA II

Area Description

- Predominant Character

Planning Area II is a high intensity, urban area with a mix of industrial, commercial and marine uses. The mix of uses is more oriented to urban commercial than to heavy industry although some heavy industry is present. Much of the character of the planning area is formed from the convergence of highway, rail and water transportation systems.

- Major Committed Uses

In addition to existing industrial, urban commercial and marine uses, the planning area is also an important fish passage, rearing and feeding area; it provides a commercial fishery on migrating fish; some waterfowl nesting areas exist in the southwestern portions; log storage areas and industrial waste discharge occur within this area; and major regional, north/south transportation linkages exist in this planning area. Some upland dredged material disposal sites exist in this area.

- Major Existing or Potential Conflicts

The primary conflicts occur as a result of the demands of urban development and the needs of the water system to support fish passage, resting and feeding. As the focal point for development and transportation, high demands are placed on the water system and thereby the quality of the water. As the focal point for fish migration, water quality is a critical factor for fish movement and in-transit feeding.

- Planning Area Assets

The area has good connections to all major regional transportation systems; although somewhat limited, back-up land for industrial and commercial development is available in portions of the south shore; relatively low channel maintenance requirements exist through most of the planning area because of good currents; some relatively productive feeding and rearing areas do exist for crab and fish, particularly in the western portion of the planning area.

Planning Area Guidelines

Management of the Natural Resource

- Bankline

Generally, the bankline should be intensively developed with the most intensive uses in the central and northwestern portions of the planning area. Redevelopment is an important management and development strategy in this planning area as little undeveloped land presently exists.

- Water Area

The primary function of the water area is transportation for both marine vessels and fish. Alteration of the water surface area is possible provided that it does not detract from the navigation capacity of the corridor or fish movement. A more natural bankline along the western portions of the south shore will be maintained to ensure adequate areas for fish feeding.

- Water Quality and Hydraulics

Any new or redeveloped uses within the planning area will be required to meet water quality standards. Waste discharge should not cause a degradation in the existing water quality and should be balanced against the assimilative capacity of the area. New discharges should also be evaluated against any detrimental effects they might have to the waste treatment efforts of existing industry.

- Fish and Wildlife

Except for the southwestern portion, this planning area is not considered a prime fish or wildlife area. An active wildlife and fishery management program in all but the southwestern area is not consistent with the overall character of the area although the fish and wildlife resource is important, particularly as it supports other areas of the estuary and river system.

- Vegetation

The salt marsh areas on the south shore are important for food production for fish moving through the planning area. The riparian vegetation adjacent to Charley and Newskah Creeks is important and should be protected but will not be actively managed.

- Aggregate and Minerals

While no known aggregate or mineral deposits exist within the planning area, utilization of upland areas for aggregate reclamation of dredge materials is considered generally consistent with the overall character of the planning area.

Development Within the Planning Area

- Economic Base

This planning area is the focal point for a large regional area particularly as related to regional transportation systems. Commercial and industrial uses that depend upon and directly support the needs of the regional market are seen as appropriate to this planning area. Additionally, the passage of fish through this area to and from up-river feeding, spawning and rearing areas, is an important link to the commercial and sport fisheries industry.

- Use Character

The overriding character of the planning area is that of high intensity urban development that is consistent with other planning area guidelines.

- Recreation

Recreation use within the planning area is an important but not dominant use. Existing recreational water access should be maintained and improved with additional access developed. Opportunities to use the visual qualities of both the water and industrial activities will be encouraged.

- Resource Harvesting

Resource harvesting is not a primary activity within this planning area, but is acceptable provided it is consistent with other planning area guidelines.

- Navigation

Continued use of the water surface and corridor for navigation has high priority within the planning area.

- Structures and Fills

In-water and shoreline structures are permissible in this planning area although their use in the western portions of the south shore will be restricted. In all cases, in-water structures are preferred to fills.

PLANNING AREA III

Area Description

- Predominant Character

Planning Area III is a mixture of urban-industrial development and natural resource areas. The predominant developed character is heavy industrial and port facilities. Within the natural resource areas, the character is tide flats and salt marsh.

- Major Committed Uses

Committed developed uses include: major industrial and port development, regional air and rail transportation, upland log storage, and dredged material disposal. Committed resource uses include: water fowl and shore bird resting, feeding and rearing areas, fish rearing and passage, crab rearing and commercial fishing.

- Major Exising or Potential Conflicts

The primary conflicts exist between demands for the development of new industrial areas and the loss of fish and wildlife habitat that would result from filling and dredging. There is also a potential for a similar conflict if the area is used for dredged materials disposal associated with both channel deepening and maintenance.

- Planning Area Assets

The planning area represents the prime area remaining for large industrial expansion in immediate proximity to the navigation channel, land-based transportation facilities, other urban facilities and a local labor force. At the same time, it represents an area of high food production for water fowl, shore birds, crab and fish.

Planning Area Guidelines

Management of the Natural Resource

- Bankline

In the eastern portion of the planning area, the bankline will continue to be used in a highly altered condition. While the bankline in the central portion will be altered somewhat through upland development, much of its present configuration will remain unaltered. Along the north shore, the riprap along the road and rail line will remain. The bankline in the Rennie Island area will be managed in accordance with it short and long-term management unit policies.

- Water Area

The water area serves as a primary transportation corridor in the south and as a natural resource area north of the airfield. The primary alteration of the water surface will occur west of the airfield and in specific, locations along the north bankline and adjacent to the navigation channel.

- Water Quality

Any new or redeveloped uses within the planning area will be required to meet water quality standards. Waste discharge should not cause a degradation in the existing water quality and should be balanced against the assimilative capacity of the area. New discharges should also be evaluated against any detrimental effects they might have to the waste treatment efforts of existing industry.

- Fish and Wildlife

This area is considered to have some of the prime fish habitat in the estuary. Of particular importance will be the protection of fish and shellfish migration and feeding areas along the shoreline, north of the navigation channel. Additionally, the Rennie Island area will serve as a potential location for future wildlife habitat development and enhancement.

- Vegetation

The vegetation in the Rennie Island area and most of vegetation north of the airfield will be preserved consistent with Special Conditions sited in the Management Unit.

- Aggregate and Minerals

While no known aggregate or mineral deposits exist within the planning area, utilization of upland areas for aggregate reclamation of dredge materials is considered generally consistent with the overall character of the planning area.

Development Within the Area

- Economic Base

This planning area is the central area for major economic expansion within the Grays Harbor region. As such, use of the land and water areas will be primarily for heavy industry directly related to the region's basic economic sectors.

- Use Character

The overriding character of the planning area is that of high intensity urban development that is consistent with other planning area guidelines.

- Recreation

Recreational use is generally not associated with the overall character of the area. However, compatible recreation activities should not be precluded.

- Resource Harvesting

Resource harvesting is not a primary activity within this planning area, but is acceptable provided it is consistent with other planning area guidelines.

- Navigation

Continued use of the water surface and corridor for navigation has high priority within the planning area.

- Structures and Fills

In-water and shoreline structures are permissible within this planning area. Fills are permitted within this planning area but only as allowed under specific management unit guidelines.

PLANNING AREA IV

Area Description

- Predominant Character

The predominant character of Planning Area IV is aquatic (water as opposed to land), with heavy tidal influence and low intensity development.

- Major Committed Uses

The use of the area is mixed, with substantial commitments to commercial fishing, oyster production and crab and fish rearing. Additional important uses include hunting and recreational fishing, wildlife observation and sparse upland development, including some agricultural products' processing.

- Major Existing or Potential Conflicts

The planning area is relatively free of conflict except for the potential effects of navigation channel dredging and spoiling on adjacent oyster rearing areas. This is particularly true in the Whitcomb Flats area of the realigned channel. The ability of the area to maintain its natural productivity and continue to assimilate up-river waste discharge could be a long-term conflict.

- Planning Area Assets

The planning area contributes substantially to commercial and sport fishing and to shellfish productivity. Its large water area allows it to play an important role in waste assimilation. Finally, the area is without substantial development pressures.

Planning Area Guidelines

Management of the Natural Resources

- Bankline

The majority of the bankline within this planning area at present is unaltered and should remain so. Minor alterations for erosion control and maintenance of adjacent facilities are permitted. No substantial alterations from the natural configuration will be permitted.

- Water Area

Any alteration of the water area is discouraged unless it will contribute directly to the enhancement of the fisheries resource or the waste assimilative capacity of the area.

- Water Quality and Hydraulics

This planning area serves a particularly important function in assimilating waste discharge for the upper estuary areas. Any new or redeveloped uses within the planning area will be required to meet water quality standards. Waste discharge standards should not cause the degradation of existing water quality and should be balanced against the assimilative capacity of the area. New discharges should also be evaluated against any detrimental effects that they have to the waste treatment efforts of existing industry.

- Fish and Wildlife

This planning area is one of the prime fisheries and wildlife feeding and harvesting areas in the estuary. Active management programs for fisheries and habitat enhancement should be encouraged in this area. Portions of the planning area suitable for aquaculture should be protected and reserved for such uses. Whitcomb Flats area should be managed as a potentially valuable oyster rearing area.

- Vegetation

Existing vegetation should be maintained throughout this planning area. The saltmarsh and marsh areas in the Johns River area in particular should be preserved in their existing state without alteration.

- Aggregate and Minerals

Although aggregate or mineral deposits are known to exist within the planning area, mining is not compatible with the character of the planning area.

Development Within the Planning Area

- Economic Base

The planning area directly contributes to the local and regional economy through commercial fish harvest and indirectly through production of fish and wildlife. Additionally, the area provides recreational hunting and fishing for both the local and regional recreationalist. The cranberry processing plant in the Markham area, although a relatively small employer, is a critical link in the northwest cranberry industry and should be continued.

- Use Character

The general character of the planning area is rural, large expanses of tidelands, and low intensity development. Any change in the intensity of the use of the area would be inconsistent with its predominant character.

- Recreation

The present recreational use of the planning area should be encouraged, with no general increase in the intensity of the use. Opportunities for wildlife viewing should be encouraged.

- Resource Harvesting

Selected timber harvesting will be allowed within constraints of other planning area guidelines. Commercial fishing is recognized as important resource harvest activity in the planning area as is oyster rearing and other aquaculture interests.

- Navigation

The water surface is an important transportation route and fishing use area for commercial fishing and sport fishermen. Navigation aids should be maintained for these shallow draft vessels.

- Structures and Fills

In general, filling within the planning area is inconsistent with the character of the area unless it will enhance the fisheries or wildlife habitat. Bank protections, navigational aids and in-water navigational mooring facilities are acceptable providing they meet the other planning guidelines for the area. Upland filling and structures are acceptable providing they are consistent with other planning area guidelines.

PLANNING AREA V

Area Description

- Predominant Character

The predominant character of the planning area is natural, aquatic with heavy tidal influence. Along with Planning Area VII, this is the least disturbed planning area in the estuary.

- Major Committed Uses

Primary uses within the planning area include resource production and harvesting. Specific uses include: oyster and fish rearing, water fowl and shore bird resting, feeding and rearing, recreation and commercial harvesting of fish, shellfish, and wildlife, and uplands agriculture.

- Major Existing or Potential Conflicts

The only foreseeable conflict is with upland residential development pressures in the northwestern portions of the planning area.

- Planning Area Assets

The planning area contains the largest water surface within the estuary. Additionally, it contains the largest population of water fowl and shore birds, one of the estuary's largest fisheries and a substantial amount of the oyster rearing and harvesting in the estuary. Perhaps its greatest asset is that it lacks conflicts.

Planning Area Guidelines

Management of the Natural Resources

- Bankline

The bankline in this planning area will be maintained in its natural configuration. Bank protection and minor bank modification for erosion control will be permitted.

- Water Area

The water area should be maintained in its present configuration.

- Water Quality and Hydraulics

Existing high levels of water quality will be maintained to ensure continued oyster production and high fishery and wildlife production values currently enjoyed in the area. Any major alterations to the estuary bed will be designed to prevent detrimental effects on estuary hydraulics.

- Fisheries and Wildlife

Fish and wildlife resources are of extremely high value in the area and will be actively maintained and managed to ensure existing levels. Oyster production will be encouraged throughout the planning area. The Goose and Sand Island Refuges should be maintained.

- Vegetation

Selective harvesting of timber resources will be allowed in the planning area provided it does not detract from other planning area guidelines, utilizes accepted forest harvesting practices, and is consistent with other applicable regulations. All other vegetation, including marsh areas, will be maintained in their present condition with a particular emphasis on riparian vegetation.

- Aggregate and Minerals

Although deposits of minerals and aggregates are known to exist in the planning area, their extraction will be discouraged unless directly associated with navigational maintenance needs.

Development Within the Planning Area

- Economic Base

The planning area provides direct support to the local and regional economy through recreational hunting and fishing, commercial fishing, oyster production, and agriculture.

It provides secondary support to the natural resource, fishery and wildlife resource base through fish rearing and habitat areas. These roles are important and should be maintained. Existing agricultural land in the cranberry area and small farming area are considered compatible to the area and should continue.

- Use Character

The natural aquatic tideflat character of the area should be maintained along with the generally low intensity of use.

- Recreation

The present recreation use of the planning area should be maintained with no general increase in the intensity of the use. Passive recreational development related to wildlife viewing or hunting and fishing is compatible with the area and should be encouraged. High intensity recreational development should be discouraged.

- Resource Harvesting

Commercial fishing and oyster culture should be encouraged and continued as should sport fish and wildlife harvest. Selected timber harvesting will be allowed within the constraints of other planning area guidelines.

- Navigation

The major shipping channel in the southern portion of the planning area is a major transportation corridor and should be maintained. Navigational aids in the remainder of the planning area for shallow draft vessels should be maintained where appropriate.

- Structures and Fills

In general, structures and fills within the water area are inconsistent with the character of the area, except for limited personal boat docks. In-water structures are also considered inconsistent with the area except as necessary for navigational aids and limited bankline maintenance. Upland filling and structures may be acceptable if they do not detract from other planning area guidelines.

PLANNING AREA VI

Area Description

- Predominant Character

The character of this planning area is a mixture of urban, residential/recreational and estuarine. While there is substantial urban development with homes, homesites, a marina and other businesses, the area also contains areas of more natural, estuarine influence.

- Major Committed Uses

Primary committed uses within the planning area include the Oyhut Wildlife Recreation

Area, the Ocean Shores marina, developed homes and homesites, recreational hunting and fishing, passive recreational/water use on large areas of publicly owned waterfront lands, the north jetty and oyster rearing and harvesting.

- Major Existing or Potential Conflicts

Most conflicts relate to the continued development of the residential/recreational uses in the City of Ocean Shores and the preservation of unique or important natural areas along the shoreline. The major specific conflicts are with the proposed relocation of the Ocean Shores airport to a site along the shoreline and with the marina entrance channel maintenance dredging.

- Planning Area Assets

A principal asset of this planning area is it ability to absorb a substantial amount of the long-term demand for recreational/residential development and destination tourism. It also contains areas that contribute to the total productivity of the estuary and unique areas (such as the Oyhut Refuge) that have permanently preserved natural assets. Its proximity to the ocean is also considered an asset.

Planning Area Guidelines

Management of the Natural Resources

- Bankline

The existing bankline within the planning area contains major structural modifications associated with the north jetty, bank protection devices, and the Ocean Shores marina. Continued maintenance of these facilities is consistent with other guidelines for this planning area. Other planning area banklines will be managed as a finite resource, maintaining a natural configuration to as great an extent as possible.

- Water Area

In general, the existing water area will remain in its present configuration. Minor alterations for jetty and marina maintenance will be permitted.

- Water Quality and Hydraulics

Any alteration of the planning area should not detract from existing high water quality. Any modifications to the estuary bed will be designed to prevent detrimental effects on estuary hydraulics.

- Fish and Wildlife

Fish and wildlife resources will be managed at or above the present level. The Oyhut Wildlife Recreational Area will continue to be an area of high priority for active wildlife management.

- Vegetation

Significant riparian vegetation and marsh and saltwater marsh exist throughout the planning area. Alteration of these areas should be minimal and selective. Any alteration to present vegetation should not detract from the overall character of the vegetation in the planning area.

- Aggregate and Minerals

Mining of materials or aggregates will be discouraged unless directly associated with navigation maintenance.

Development Within the Planning Area

- Economic Base

The planning area provides a direct support to the local and regional economy through the recreation industry. The planning area serves as a portion of one of the two destination recreation centers in the Grays Harbor area. Its recreation role is more passive in relation to the estuary and other water areas than is in Planning Area VIII, although the Ocean Shores marina area does contribute to the sport and commercial fishing industries.

- Use Character

The use character of the planning area is a mixture of urban residential, recreational and estuarine. The character of the southern and western areas is marine, open sea. This mixed character should be maintained as it represents one of the planning area's primary assets.

- Recreation

The planning area is a major destination recreation center for western Washington. Permanent facilities to accommodate this demand should be maintained and selective additional facilities developed in a manner that is consistent with other guidelines. Active and passive recreation should be encouraged in all areas.

- Resource Harvesting

Major resource harvesting in the area associated with sport and commercial fishing should be continued.

- Navigation

The southern portion of the planning area includes the main harbor navigation channel. This vital transportation link to the upper estuary should continue to be maintained. The navigation channel into the Ocean Shores Marina is consistent with the character and guidelines for the planning area and should be maintained.

- Structures and Fills

In general, in-water fills and structures are not consistent with the overall character of the planning area except as required to maintain existing facilities.

PLANNING AREA VII

Area Description

- Predominant Character

The predominant character of the planning area is natural.

- Major Committed Uses

In addition to a substantial fish and shellfish resource and wildlife habitat, the area is committed, through private clubs, as a major private recreational area for hunting and wildlife observation. The small residential area of Bay City is also a part of this planning area.

- Major Existing or Potential Conflicts

The planning area is relatively free of conflicts although maintenance of the authorized channel could create pressures for uses that would be inconsistent with the predominant character of the area.

- Planning Area Assets

The principal asset of the planning area is that it is a relatively undisturbed natural area with no conflicts or pressures.

Planning Area Guidelines

Management of the Natural Resources

- Bankline

The bankline in the planning area will be maintained in its present natural condition except those areas immediately proximate to the highway, bridge and erosion tidegates. Necessary maintenance of existing facilities will be permitted.

- Water Area

The water area will remain in its present configuration. Any reduction of the existing water area, unless directly related to increased production of fish and wildlife, is not consistent with the area's character or role within the estuary.

- Water Quality and Hydraulics

Existing high levels of water quality will be maintained. Any use which would reduce existing water quality would not be compatible with the long-term use of the area.

- Fish and Wildlife

Fish and wildlife resources will be actively managed to maintain and enhance their current levels. Such programs will encourage aquaculture (including oyster production).

- Vegetation

Selective harvesting of timber resources will be allowed within the planning area, provided it does not detract from other planning area guidelines and utilizes accepted forest harvesting practices. All other vegetation, including all marsh areas, will be maintained in their present condition.

- Aggregate and Minerals

The mining of aggregate and mineral resources in this area is not compatible with other planning area guidelines.

Development Within the Planning Area

- Economic Base

The planning area provides direct support to the local and regional economy through recreational hunting and fishing. Additionally, it provides secondary support to the commercial fisheries industry as a fish and oyster rearing area. These two roles are most important to the Grays Harbor region and should be maintained. The planning area also provides a unique role to the recreation industry through the private hunting clubs. Those uses should be encouraged and continued.

- Use Character

The general natural, unaltered character of the planning area should be maintained. Any deviation from the existing character is possible only on the eastern and northern extremes of the planning area, and then only in the uplands or areas immediately adjacent to the highway. No substantial developed uses should occur within this planning area.

- Recreation

The current level of recreation use should be maintained with no general increase in use intensity. Limited additional pedestrian access may be acceptable but without major supporting facilities. Existing private duck clubs and facilities are compatible uses in the planning area.

- Resource Harvesting

Timber harvesting will be allowed within the constraints of other planning area guidelines. Commercial and recreational fishing and hunting are considered beneficial uses of the area as is oyster production and harvest.

- Navigation

While there is an authorized navigational channel from Point Chehalis to the Elk River Bridge, dredging to maintain the channel to its authorized depth is not compatible with the area. In-water navigation aids for shallow draft vessels are acceptable as necessary.

- Structures and Fills

In general, in-water filling within the planning area is inconsistent with the character and use of the area. In-water structures, other than those required for navigation safety and

the existing highway are also inconsistent with the character and use of the area. Upland filling and structures may be acceptable provided they do not detract from other planning area guidelines.

PLANNING AREA VIII

Area Description

- Predominant Character

The predominant character of the planning area is urban fishing. The substantial commercial and sport fishing facilities and supporting activities dominate the physical, social and economic character of the developed portion of the planning area. Large areas of salt marsh and tideflats exist in the undeveloped portion of the planning area.

- Major Committed Uses

Committed uses are those that directly relate to the commercial and sport fishing industries. Those facilities include a marina, airport, state park, fish processing industries, supporting commercial and tourist facilities and the south jetty, revetment and groin system. Productive salt marsh areas also exist in the south part of the planning area as do some in-water, dredged materials disposal sites.

- Major Existing or Potential Conflicts

The principal conflicts occur with proposals to continue to develop fishing and tourism facilities and the adjacent estuarine resources. Specific conflicts include expansion of the marina and airport site, continuing increases in the overall intensity of use of the shoreline and adjacent water areas, in-water, dredged materials disposal and general shoreline property development.

- Planning Area Assets

The primary assets of the planning area are its proximity to the ocean and its substantial commitment to support the commercial and sport fishing industry. Additionally, the Westport Marina serves as the port of refuge for a substantial area of the Washington coast.

Planning Area Guidelines

Management of the Natural Resources

- Bankline

The highly altered banklines in the north and northeasterly portion of the planning area should be maintained and are considered acceptable alterations. The natural bankline in the Half Moon Bay State Park area and in the southern portion of the planning area shall be managed as a finite resource maintaining a natural configuration to as great an extent as possible.

- Water Area

The existing water area will remain substantially in its present configuration. Minor alterations for maintenance of the existing bankline, protective structures and the marina access channel will be permitted.

- Water Quality and Hydraulics

The existing high levels of water quality will be maintained to ensure the continued production of fish and wildlife and oysters adjacent to the planning area. Any new developments or discharges will be evaluated to determine any detrimental effects they might have on existing water quality.

- Fish and Wildlife

Fish and wildlife resources will be managed to maintain and enhance their present condition.

- Vegetation

Marsh is the primary vegetative type within this planning area. Subject to permitted uses and activities identified for specific management units, that marsh will be maintained. Some destruction of the marsh areas to the east and north of the airport is possible to accommodate the raising of the existing airport and a limited expansion of the marina. Only the minimum amount of marsh areas to accomplish the projects will be allowed to be destroyed.

- Aggregate and Minerals

There are no known deposits of commercially significant aggregate and minerals within the area. Development of discovered resources should be only in conjunction with navigation channel maintenance.

Development Within the Planning Area

- Economic Base

The planning area provides a direct contribution to the local and regional economy through commercial fisheries and sport fishery recreation. In addition to Ocean Shores, this planning area represents the other major recreation destination center in the Grays Harbor region. The economic base of the planning area is dominated by the recreation and fisheries industries and draws on a large regional and national market for its support. Continuation of this economic role is considered vital to the Grays Harbor region.

- Use Character

The predominant character of the northern and central portions of the planning area is highly developed, marine-oriented, recreation and fishing uses. This character should be continued and enhanced. The southern portion of the planning area represents a transition from the more developed northern areas to the natural areas in Planning Area VII. This transition is important to maintain the integrity of both areas. No substantial development should occur in this southern area.

- Recreation

The area represents the major destination recreation center associated with sport fishing. Facilities in support of this activity should be encouraged.

- Resource Harvesting

This planning area is the focus for commercial fish harvesting and processing and aquaculture within the Grays Harbor region. The continuation and enhancement of those operations is compatible with role and character of the planning area. The greatest portion of sport fisheries harvest is landed in this area. Support facilities for these harvest activities should be maintained and encouraged.

- Navigation

Continued maintenance of the navigation channel into the marina area is critical to the primary economic role of the planning area. Maintenance of the authorized channel into Planning Area VII is not considered appropriate to the guidelines of that planning area. Navigation aids are appropriate in the planning area.

- Structures and Fills

In general, major in-water filling is considered inconsistent with other planning area guidelines, the fisheries resource and navigation. In-water structures may be appropriate in existing developed areas and in direct support of the recreation or fisheries industry. Navigational structures and erosion control devices such as jetties and groins are acceptable uses in the area. Upland filling and structures are acceptable providing they do not detract from other planning area guidelines.

MANAGEMENT UNITS

Management units are designed to provide specific guidance to planning and development activities as well as management of the natural resources throughout the estuary. Most management units represent segments of the shoreline and include both upland and aquatic areas with the latter extending to the line of Ordinary High Water. The remainder of the aquatic area below this line is also a management unit known as Management Unit 44. Within this unit are also a few special "in-water" management units (see page 107).

Each management unit contains a designated Management Category, a statement of the overall Management Objective for the unit, a listing of the Permitted Activities allowable within the unit and a reference to a set of allowable Standard Uses. In addition, some management units contain Special Conditions that describe circumstances that are unique to that particular unit and that may place additional standards on the allowability of uses and activities.

Management Unit 44 is the largest, most unique and perhaps the most difficult to manage within the estuary. As essentially the "water" area of the harbor, it serves as the important linkage for many of the adjacent "upland" uses and at the same time the foundation for the natural resource systems of the estuary. They key to the management problem in Management Unit 44 is its relationship to these other needs, uses and areas. While overall, this unit is to be managed for its relationship to the natural resources, it nonetheless recognizes its role in providing direct support to adjacent shoreland areas where certain uses and activities are allowable and require connection to the aquatic or water areas.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls	●	
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater	□	
BANK	Diking		
	Bulkheading		
	Groins	●	
	Jetty	●	
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 1
PLANNING AREA VI

Management Category

CM - Conservancy Managed

Boundary Description

Western Boundary - western terminus of the north jetty.
Eastern Boundary - approximate intersection of section line (T17N, R12W, Section 27) with bankline or at intersection of submerged jetty with bankline.

Management Objectives

The management unit serves principally as a navigation feature and secondarily for public recreation and enjoyment.

Special Conditions

The City of Ocean Shores wastewater treatment plant exists within this management unit and is generally compatible with the purposes of this management unit. Expansion of that facility will fall under the following guidelines:

a. Modification to equipment or minor external changes or additions within the present site configuration will be subject to local city permit processes.

b. Modification or expansion that involves major facilities and/or enlargement of the present site configuration is considered an intensification of the present use and is subject to review and comment by the Estuary Planning Task Force as well as local city permit processes.

MANAGEMENT UNIT 2
PLANNING AREA VI

Management Category

N - Natural

Boundary Description

Western Boundary - Management Unit 1.
Eastern Boundary - approximate eastern site of water outlet from mud flat area.
Study Area Boundary - State Game and Department of Natural Resources property out to the old North Jetty.

Management Objectives

This area encompasses all of the state game properties and will remain in an undisturbed, natural condition.

Special Conditions

1. The existing V.O.R. airplane navigation facility and site is considered appropriate as are the maintenance activities necessary to support it.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	N	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty	□	
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	*	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 3
PLANNING AREA VI

Management Category

CM - Conservancy Managed

Boundary Description

Western Boundary - Management Unit 2.
Eastern Boundary - intersection of Damon Point with main bankline.
Study Area Boundary - the edge of the platted properties between Mariners Way and Marine View Drive.

Management Objectives

Damon Point is considered a valuable recreational resource and will be managed for those purposes.

Special Conditions

Because Damon Point is an unstabilized sandspit, it is probable that its present configuration will change. No attempts will be made to artificially stabilize the spit. If future changes begin to interfere with the purposes of adjacent management units, remedies will be considered through the plan amendment procedures.

MANAGEMENT UNIT 4
PLANNING AREA VI

Management Category

UM - Urban Mixed

Boundary Description

Southern Boundary - Management Unit 3.
Northern Boundary - the northern property line of the Ocean Shores Beach and Yacht Club.
Study Area Boundary - Marine View Drive and Catala Avenue.
Eastern Boundary - Marina Entrance*

Management Objectives

This is the primary waterfront development area in Ocean Shores. It presently contains the Ocean Shores Marina and Country Club. Future development will reinforce and expand on the present uses.

Special Conditions

Continued operation and maintenance of the existing outfall in this management unit is allowed. New outfalls that may be required to support the runoff needs will not be allowed within the marina.

*This management unit goes beyond the normal waterward boundary to encompass the total marina complex.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges		
	Causeways		
	Outfalls	✱	
	Cable/Pipeline Crossing	□	
	Boathouses	●	
	Breakwater	●	
BANK	Diking	□	
	Bulkheading	□	
	Groins	□	
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	●	
	Channel/Berth Maint.	●	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UR	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing		
	Boathouses	*	
	Breakwater		
BANK	Diking	*	
	Bulkheading	*	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	*	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 5
PLANNING AREA VI

Management Category

UR - Urban Residential

Boundary Description

Southern Boundary - Management Unit 4.
Northern Boundary - the northern limits of the shorefront platted residential properties, approximately at the intersection of Harbor View Drive and Duck Lake Drive.
Study Area Boundary - Duck Lake Drive.

Management Objectives

This management unit will be used entirely for public shoreline access and recreation with shorefront residential properties immediately behind. Existing public access points will be maintained as will all areas of aquatic vegetation.

Special Conditions

1. Sloped, interlocking concrete slab type bulkheading is permitted only as a means of erosion control with existing platted residential lots and only out to the waterw limit of those lots.

2. Diking is permitted as an alternative means of erosion control to bulkheading as specified in Special Condition #1 above.

3. Boathouses are permitted only within the existing lagoon area.

MANAGEMENT UNIT 6
PLANNING AREA VI

Management Category

UM/N - Urban Mixed/Natural

Boundary Description

Southern Boundary - Management Unit 5.
Northern Boundary - Ocean Shores city boundary or the southern line of Section 26 (T18N, R12W).
Split Unit Boundary - line of non-aquatic vegetation (Section 404).
Study Area Boundary - Duck Lake Drive and North Bay Avenue.

Management Objectives

Within the urban mixed portion, the management intent is to allow the eventual development of a new airport for Ocean Shores, as well as the continued development of residential properties. Within the remainder of the area, the property will remain in an undisturbed, natural condition.

Special Conditions

1. Sloped, interlocking concrete slab type bulkheading is permitted only as a means of erosion control with existing platted residential lots and only out to the waterward limit of those lots.

2. Diking is permitted as an alternative means to erosion control to bulkheading as specified in Special Condition #1 above.

3. The City of Ocean Shores is unique both from the standpoint of its physical setting as well as its history. As a major land development project from the 1960's, the plan for the now incorporated city was established to achieve land sales objectives. These objectives have resulted in the parcelization and sales in excess of 11,000 homesites and the location of the existing airfield in the middle of and totally surrounded by developing parcels, posing problems not only of runway and facility capacity, but also safety. As an economy based on tourism, the city has considered alternatives for upgrading the airfield to allow greater usability and safety, which have included a review of the existing and alternative sites. The existing site, while an ideal location, was discarded because of its inability to be to either upgrade its capacity or solve safety problems. A private airfield at Hogan's Corner, approximately 1½ miles north of the city, 2½ miles north of the existing airfield was discarded because of its location, safety problems associated with adjacent homes and the need for intrusion into marsh areas for airfield expansion. No other property exists within the city of adequate size to accommodate the airfield except the proposed site, approximately ½ mile east of the existing airfield and within Management Unit 6.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	N
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	*	*
	Bulkheading	*	
	Groins		
	Jetty		
	Special Project Fills	*	*
	Bankline Straightening		
	Bankline Erosion Control	*	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

The location of the facility at the proposed site in accordance with the Airport Master Plan and Environmental Impact Statement (1976) would involve partial intrusion into a salt marsh area. Filling of these areas must comply with appropriate permitting processes, including the Section 404 permit process. However, based on current information and subject to the following conditions, the location of the airfield within Management Unit 6 would not have an unacceptable adverse impact on the aquatic ecosystem, including wetlands within the meaning of Section 404 Guidelines.

a. That sufficient property fronting North Bay Avenue be acquired to allow the shifting of the airfield to the west.

b. That the entire facility be redesigned to minimum F.A.A. standards in accordance to the Proposed Design Revision dated 11/2/78(77). The emphasis of that redesign is on reducing the dimensions between the taxi-way and adjacent property; the taxi-way and runway; the runway and the toe of the outer slope of the fill; the safety zones at the end of the runway.

c. That the remainder of the 230 acres (approximately 190-200 acres) will be preserved as a permanent natural area through the establishment of a conservation easement (or similar mechanism); that the easement will be granted to an agreed upon state or federal resource agency, or an independent nature conservancy organization; that the easement will indicate that the area will be preserved for the use of fish and wildlife, and, conversely, will not be used for development.

d. That a mitigation project (see discussion of Mitigation, page 26) will be developed and approved by State and Federal resource agencies in advance of a permit issuance, and that an implementation schedule for the mitigation project will be committed to and initiated at the time of permit issuance.

MANAGEMENT UNIT 7
PLANNING AREA V

Management Category

CM - Conservancy Managed

Boundary Description

Southern Boundary - Management Unit 6
Northern (East) Boundary - Farm Road and ease side of Kurtz Slough.
Study Area Boundary - a line at approximately 20 feet elevation or the line of non-aquatic vegetation and the Ocean Shores Road on the west.

Management Objectives

This area will remain in an undisturbed condition although some opportunities for recreational use will be possible under the guidelines of Standard Uses and Permitted Activities.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RA	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing		
	Boathouses	●	
	Breakwater		
BANK	Diking	*	
	Bulkheading	*	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	*	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 8
PLANNING AREA V

Management Category

RA - Rural Agriculture

Boundary Description

Western Boundary - Management Unit 7.
Eastern Boundary - west side of Campbell Slough.
Study Area Boundary - Ocean Shores Highway.

Management Objectives

This area is one of the few agricultural areas within the study area of the Estuary Management Plan. Because of the valuable agricultural resource it represents, future uses and activities will be permitted consistent with that purpose.

Special Conditions

1. Diking and bulkheading with sloped, interlocking concrete slabs, are permitted only in association with necessary road maintenance and to protect existing structures.

MANAGEMENT UNIT 9
PLANNING AREA V

Management Category

RL/N - Rural Low Intensity/Natural

Boundary Description

Western Boundary - Management Unit 8.
Eastern Boundary - east side of Gillis Slough.
Split Unit Boundary - line of non-aquatic vegetation.
Study Area Boundary - Ocean Shores Highway.

Management Objectives

On the water side of the Section 404 line, the area will remain in an undisturbed, natural condition. On the land side of the Section 404 line, the area may be used as a rural area in accordance with the guidelines of Standard Uses and Permitted Activities.

Special Conditions

1. Boathouses are acceptable only on Campbell and Jessie Sloughs and are even then considered a conditional use subject to site specific, case-by-case review.

2. The installation of piers, docks, wharves, piling and mooring dolphins is allowable only through the application of conditional use standards and provided that no new navigation channel is required.

3. Piers, docks, wharves, piling and mooring dolphins will be allowed associated with small private residential uses and provided that it does not interefere with the management of Department of Game property at the mouth of Humptulip River.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	N
STRUCTURES	Piers, Docks, Wharves	*	*
	Piling & Mooring Dolphins	*	*
	Bridges	●	
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing	□	
	Boathouses	*	
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	
STRUCTURES	Piers, Docks, Wharves	*	
	Piling & Mooring Dolphins	*	
	Bridges	●	
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	□	
	Boathouses	●	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 10
PLANNING AREA V

Management Category

RL - Rural Low Intensity

Boundary Description

Western (North) Boundary - Management Unit 9.
Eastern Boundary - the eastern line of Section 12 (T17N, R11W) or the western boundary of port ownership.
Study Area Boundary - Burlington Northern rail line and line of non-aquatic vegetation along Grass Creek.

Management Objective

No significant development activity is envisioned in any portion of this management unit except as consistent with guidelines of Standard Uses and Permitted Activities.

Special Conditions

1. Continued maintenance of existing railroad rights-of-way and facilities is permitted.

2. The installation of piers, docks, wharves, piling and mooring dolphins is allowable provided that no new navigation channel is required.

3. Piers, docks, wharves, piling and mooring dolphins will be allowed associated with small private residential uses and provided that it does not interefere with the management of Department of Game property at the mouth of the Humptulip River.

MANAGEMENT UNIT 11
PLANNING AREA III

Management Category

UD - Urban Development

Boundary Description

Western Boundary - Management Unit 10
Eastern Boundary - Hoquiam City boundary.
Study Area Boundary - Railroad tracks.
Waterward Boundary - line of non-aquatic vegetation (Section 404) or northern line of Port of Grays Harbor ownership, whichever extends furthest south.

Management Objectives

This management objective is principally a transportation corridor containing both the Ocean Shores Highway and the Burlington Northern rail line. Continued use of the management unit for this purpose is considered appropriate.

Special Conditions

1. This management unit is immediately adjacent to Management Unit 12. Continued maintenance of the railroad line and highway is permitted.

2. Highway improvements at the "Grays Harbor City curve" are permitted subject to the terms and conditions defined in Corps of Engineers permit No. 071-OYB-2-005073.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●
CONDITIONAL ACTIVITY □
SPECIAL CONDITIONS ✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	SP	
STRUCTURES	Piers, Docks, Wharves	✱	
	Piling & Mooring Dolphins	✱	
	Bridges		
	Causeways		
	Outfalls	✱	
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	✱	
	Bulkheading	✱	
	Groins		
	Jetty		
	Special Project Fills	✱	
	Bankline Straightening	✱	
	Bankline Erosion Control	✱	
CHANNEL	New Access Channel	✱	
	Channel/Berth Maint.	✱	
	Channel Realignment	✱	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 12
PLANNING AREA III

MANAGEMENT CATEGORY: Special

BOUNDARY DESCRIPTION: See Attached Exhibit

MANAGEMENT OBJECTIVES

This Management Unit represents a unique area, combining both valuable habitat to be protected for fish and wildlife and future sites for the principal industrial expansion in the harbor.

Part of the Management Unit (approximately 1,700 acres) provides valuable habitat for fish and wildlife which will be managed as a natural area for the protection and enhancement of fish and wildlife resources, while other parts of the Management Unit (approximately 500 acres) will be managed to provide major new areas for industrial development within the Grays Harbor region. Filling of some intertidal areas and wetlands will be necessary to provide these new areas for industrial development.

The above objectives are mutually dependent in that the fill and development of some areas is balanced with the protection of other areas to assure multiple use of the estuary consistent with the Estuary Management Goal. The key to the management philosophy and balance for this Management Unit is that protective guarantees are established through incremental and proportional fee title transfer of tidelands and wetlands in Area 1 with fill and development in Areas 2 and 3, thereby avoiding unacceptable adverse impacts to the ecosystem. While this same management philosophy generally applies to Area 4, evaluation of impacts, alternatives and need for fill in this area have not been made in this plan and must therefore be performed in connection with specific development proposals (see additional discussion of Area 4 in this Management Unit). As always, fill for development is subject to the normal permitting process, although the permitting process itself will be improved through the advance evaluations and decisions made in this plan.

Special Conditions

Six sub-areas are included in this Management Unit (see attached exhibit)

Area 1 - Natural

Area 2 - Phase I Fill - Urban Development

Area 3 - Airport Fill - Urban Development

Area 4 - Special Designation

Area 5 - Existing Airport - Urban Development

Area 6 - Waterfront Area - Conservancy Managed

AREA 1 - NATURAL AREA

Description

Area 1 is an area of extensive tideflats, wetlands and intertidal land and contains significant shorebird habitat. The area includes all of the land owned in fee by the Port of Grays Harbor below the Section 404 line of non-aquatic vegetation, except those lands included within Areas 2, 3, 4 and 6. An additional area commonly known as "the fan" (see Management Unit 12 exhibit for further description) is also included within Area 1. The final determination of Section 404 jurisdiction will be made by the Corps of Engineers as a part of the permit process. Area 1 includes approximately 1,700 acres and is bounded on the west by the eastern line of Section 12 (T17N, R11W) and on the south by the northern edge of the authorized federal navigation channel and Areas 2, 3, 4 and 6.

Implementation Conditions

The following conditions have been developed in conjunction with conditions for Areas 2, 3, 4 and 6 and are tied, therefore, to their implementation.

1. Any filling that may be allowed within Management Unit 12 will carry with it the condition that lands within Area 1 will be preserved as natural areas through the transfer of fee title. As Areas 2, 3, 4 and 7 (see Management Unit 14 for Area 7) are filled for industrial development, fee title will be transferred for a portion of Area 1 on the basis of 3.4 acres transferred for each acre filled.* The transfer will permanently establish a balance that is essential to avoid unacceptable adverse impacts to the aquatic ecosystem, including wetlands (within the meaning of Section 404 guidelines) might otherwise result from future fills in Area 1. Transfer of title will be done in accordance with Condition 3 to follow.

2. Upon evaluation of the Final Environmental Impact Statement on this plan by the E.P.A. and the Corps of Engineers, the Port of Grays Harbor, under the provisions of 40CFR, Part 230.80, Guidelines for Specification of Disposal Sites for Dredged or

*This proportion is derived from the approximate acreage figures noted previously, which have been determined in the plan to be an acceptable balance between natural and development areas in the Bowerman Basin, i.e., 1,700 acres: 500 acres = 3.4:1.

Fill Material, will formally apply to the Environmental Protection Agency and the Corps of Engineers to designate Area 1, exclusive of Areas 2, 3, 4, 6 and 7 (in Management Unit 14) as lands where the placement of dredged or fill materials is prohibited.

3. Fee title transfer of lands within Area 1 will be accomplished in accordance with the following terms and conditions:

Recipient: Fee title will be transferred by the Port of Grays Harbor to the Washington State Department of Game. A Bowerman Basin Advisory Council will be formed consisting of representatives of state and federal resource agencies, Grays Harbor County, the Port of Grays Harbor, interested formally organized environmental groups, and at least two citizens at large to be appointed by the Grays Harbor Regional Planning Commission. As the Department of Game prepares management plans or is faced with specific management decisions on lands within Area 1 transferred to its responsibility, it will seek the review, advice and counsel of the Advisory Council. At a minimum, the Department of Game will call at least one meeting of the Advisory Council each year to review the status of transferred lands and other relevant issues.

Purpose: The purpose of the transfer is to preserve Area 1 as a natural area. However, federal or state resource agencies may undertake research on experimental habitat protection and enhancement programs in the area, provided that those actions do not interfere with allowable uses and activities of adjacent Management Units; are consistent with applicable local, state and federal policies and regulations; and are reviewed by the Bowerman Basin Advisory Council and the Department of Game.

Conveying Title: As a permit is issued for fill of a portion of the Management Unit (including Area 7, Management Unit 14), a 3.4:1 proportional amount of Area 1 will be transferred in fee. No fill may commence until the proportionate transfer of title has occurred.

The general sequence of title conveyance will be from East to West across the Bowerman Basin beginning along the northern edge of Area 1 (see Management Unit 12 Exhibit for the actual conveyance sequence). This specification is designed to act as a guideline for transfer rather than as an absolute requirement. However, as an additional guideline, parcels transferred should generally be four-sided with one dimension no greater than three times the other.

Final Parcel Conveyance: At such time as the final fill action allowed in Management Unit 12 (and Area 7 in Management Unit 14) is permitted, the remaining parts of Area 1 will be transferred. It is recognized that this final transfer may not strictly satsify the 3.4:1 proportional rule due to the fact that acreage figures for Area 1 (1,700) and Areas 2, 3, 4 and 7 (500) are only approximate.

AREA 2 - PHASE I FILL SITE - URBAN DEVELOPMENT

Description

Area 2 includes approximately 164 acres as measured to the toe of the dike for any fill within the area. The dimensions of this area are illustrated on the Management Unit 12

exhibit and represent an area as measured to the top of the dike of any fill within the area. These dimensions and the other conditions attached to this area, are established to provide for the development of a major multi-commodity, bulk loading and off-loading facility. The facility is envisioned with a rail loop transportation system and sufficient on-site storage for handling several types of bulk commodities simultaneously.

Implementation Conditions

The following conditions have been developed in conjunction with conditions for Area 1 and are tied, therefore, to their implementation.

1. As a permit is issued for fill in Area 2 for industrial development, fee title will be transferred of a portion of Area 1 on the basis of 3.4 acres transferred for each acre filled. The transfer will permanently establish a balance that is essential to avoid unacceptable adverse impacts to the aquatic ecosystem, including wetlands (within the meaning of Section 404 guidelines) that might otherwise result from additional future fills in Area 1. Transfer of title will be done in accordance with Condition 3 of the Implementation Conditions for Area 1.

2. Grays Harbor is one of the major estuaries on the west coast. The Harbor contains a total of 54,720 acres to the extreme high water line with 33,600 acres of intertidal land. It contains 5,420 acres of saltmarsh and 28,160 acres of tideflats. Between 1940 and 1975, 3,850 acres of intertidal wetlands have been impacted with the placement of dredged materials, including portions of the area within Management Unit 12. In the early portion of that period, the rate of fill was as much as 50 acres per year. More recently, that rate has slowed to 10-15 acres per year or less.

   In establishing its direction for overall management of the estuary, the Task Force recognized that economic growth involving conversion of natural habitat to industrial uses would continue at some level in the harbor during the life of this plan. In reviewing the opportunities for that growth to occur around the harbor, the Task Force reviewed the several potential areas in terms of the availability, size and usability of land, transportation access for both rail and highway, proximity to the main navigation channel, availability of utilities, relationship to the existing industrial areas, relationship to other support industries and uses and other factors. While there are several areas around the harbor that could accommodate some industrial growth, the Task Force saw that most provided only limited opportunities. In pursuing a philosophy of concentrating major future development rather than dispersing it throughout the harbor, focusing that growth into the area of Management Unit 12 met more of the criteria than any other area.

   In addition to criteria directly related to the needs of future industrial development, the Task Force considered the amounts of various types of intertidal habitat and their values to fish and wildlife resources. Fish migration habitat was considered a major limiting factor in Grays Harbor because of past developmental patterns. During the next 50 years, the plan, as drafted, will protect most of the estuarian wetlands from filling except those in this management unit. This is approximately 1.5% of the intertidal area of Grays Harbor and 6% of the estuary's low silty marsh. Although there is an adverse impact associated with filling these wetlands, the balance achieved through protection of most of the rest of the estuarian ecosystem from filling reduces the significance of the loss, and is consistent with the overall goal for management of the estuary for multiple uses.

3. Filling that occurs in Area 2 will be subject to approval through the Section 404 permit process. However, in the context of the total Management Unit and the total Estuary Management Plan, such filling is not considered to have an unacceptable impact on the aquatic ecosystem, including wetlands. This determination is made in consideration of:

   a. Implementation Condition 2, above

   b. The Management Objective for this Management Unit,

   c. The implementation of allowable fill through the application of normal local, state and federal policies and regulations,

   d. The implementation of the policies and standards of this plan,

   e. The full implementation of the conditions of this Management Unit including the fee title transfer of approximately 1,700 acres of intertidal and wetland area,

   f. The guarantees and protective measures afforded to the resources of the total harbor by this plan,

   g. The consideration, in the preparation of this plan, of the long term need of the Grays Harbor community to seek out and accommodate major new industrial diversification and expansion,

   h. The consideration, in the preparation of this plan, of alternative areas and ways to accommodate new water dependent industry and the general lack of areas as uniquely suited as this Management Unit and

   i. Implementation Condition 5, below.

4. Upon evaluation of the Final Environmental Impact Statement on this plan by the E.P.A. and the Corps of Engineers, the Port of Grays Harbor, under the provisions of 40CFR, Part 230.80, Guidelines for Specification of Disposal Sites for Dredged or Fill Material, will formally apply to the E.P.A. and the Corps of Engineers to predesignate Area 2 as an area for the discharge of dredged or fill material for water dependent industrial development subject to permit approval.

5. As filling occurs, it will be done in accordance with disposal practices approved through the permit process, including the use of containment structures surrounding each fill to preclude the unnecessary dispersal of fill material to the adjacent aquatic area. With the full review and concurrence of state and federal resource agencies, plans for the placement of fill in Area 2 will consider the selective placement of additional fills and/or non-standard design of fill dikes to recreate lost habitat on the northern edge of this area. A particular emphasis will be placed on recreating the vegetated salt marshes and woody vegetation that is similar to the vegetation on the north side of Moon Island. Additionally, piles that must be removed to accommodate the fill will be replaced in the area north of the fill site to re-establish perching sites for birds. Although the plan views this area as a fill site, rather than a dredged materials disposal site, the use of dredged material for fill meeting these special conditions is appropriate.

6. The specific size and shape of the northern portion of Area 2 (within the general dimensions illustrated on the Management Unit 12 exhibit) is determined by the engineering requirements for a railroad loop track including required maintenance roads and drainage facilities.

AREA 3 - AIRPORT FILL - URBAN DEVELOPMENT

Description

Area 3 is approximately 73 acres as measured to the toe of the dike required for a fill in this area.

Implementation Conditions

The following special conditions have been developed in conjunction with the conditions of Area 1 and are tied, therefore, to their implementation.

1. As a permit is issued for fill in Area 3 for the relocation of the Bowerman Airfield, fee title will be transferred of a portion of Area 1 on the basis of 3.4 acres transferred for each acre filled. The transfer will permanently establish a balance that is essential to avoid unacceptable adverse impacts to the aquatic ecosystem, including wetlands (within the meaning of Section 404 guidelines) that would result from future fills in Area 1. Transfer of title will be done in accordance with Condition 3 of the Implementation Conditions for Area 1.

2. Filling of Area 3 will be allowed for the relocation and expansion of the airport in order to accommodate an FAA-approved ILS Commuter Airport. However, the maximum line of fill shall be 750 feet to the north, and the fill shall be the minimum amount necessary to accommodate the ILS airport. Fill of Area 3 can only occur to accommodate the relocation of Bowerman Airfield and only when all or a majority of the existing Airfield area (Area 5) is proposed for a water dependent industrial use.

3. If Area 2 is filled prior to a permit application to fill in Area 3, an evaluation of the effects of filling in Area 2 will be conducted as a part of the permit review process. The primary purpose of that evaluation will be to determine whether environmental conditions have changed sufficiently as a result of the Area 2 fill to demonstrate that other alternative airport sites would be less environmentally damaging.

4. Filling in this area will be subject to approval through the Section 404 permit process. However, in the context of the total Management Unit and the total Estuary Management Plan, such filling is not considered to have an unacceptable adverse impact on the aquatic ecosystem, including the wetlands. This determination is made in consideration of:

   a. Implementation Condition 2, above

   b. The Management Objective for this Management Unit,

   c. The implementation of allowable fill through the application of normal local, State and Federal policies and regulations,

   d. The implementation of the policies and standards of this plan,

   e. The full implementation of the conditions of this Management Unit including the fee title transfer of approximately 1,700 acres of intertidal and wetland area,

   f. The guarantees and protective measures afforded to the resources of the total harbor by this plan,

g. The consideration, in the preparation of this plan, of the long term need of the Grays Harbor community to seek out and accommodate major new industrial diversification and expansion,

h. The consideration, in the preparation of this plan, of alternative areas and ways to accommodate new water dependent industry and the general lack of areas as uniquely suited as Area 3, and

i. Implementation Condition 5, below.

5. As filling occurs, it will be done in accordance with disposal practices approved through the permit process, including the use of containment structures surrounding each fill to preclude the unnecessary dispersal of fill material to the adjacent aquatic area. However, with the full review and concurrence of state and federal resource agencies, plans for the placement and fill in Area 3 will consider the selective placement of additional fills and/or non-standard design of fill dikes to recreate lost habitat on the northern edge of this area. A particular emphasis will be placed on recreating the vegetated salt marshes and woody vegetation on the north side of Moon Island. Additionally, piles that must be removed to accommodate the fill will be replaced in the area north of the fill site to re-establish perching sites for birds. Although the plan views this area as a fill site, rather than a dredged materials disposal site, the use of dredged material for fill meeting these special conditions is appropriate.

AREA 4 - SPECIAL DESIGNATION

Description

Area 4, as identified on the Management Unit 12 exhibit, is not intended to denote an exact location nor an absolute commitment to a future fill within that specific area. Nonetheless, for purposes of describing the conditions under which future filling might occur, the following sections are included as a part of this Management Unit. Area 4 includes approximately 243 acres. The actual acreage of this area will be defined at the time of permit considerations. However, in concept, the acreage of this area is the remainder of the sums of the acreage (to the toe of the dike) of Areas 2, 3 and 7 (in Management Unit 14) subtracted from 500 acres.

Implementation Conditions

The following conditions have been developed in conjunction with conditions for Area 1 and are tied, therefore, to their implementation.

1. As a permit is issued for fill in Area 4 for the development of water dependent industrial uses, fee title will be transferred of a portion of Area 1 on the basis of 3.4 acres transferred for each acre filled. The transfer will permanently establish a balance that is essential to avoid unacceptable adverse impacts to the aquatic ecosystem, including wetlands (within the meaning of Section 404 guidelines) that might result from additional future fills in Area 1. Transfer of title will be done in accordance with Condition 3 of the Implementation Conditions for Area 1.

2. Area 4 is a conceptual designation for future fills (Phase II fill) which are intended to provide a total of 500 acres of potential fill for industrial development within Management Unit 12 and Area 7 of Management Unit 14. The designation of Area 4

for fill does not represent a commitment that the area will actually be filled. A decision on the actual location of future fill will be made at the time of future development. This decision will be made in accordance with these conditions and will be guided by the principles of:

a. locating necessary fills in areas where there will not be an unacceptable adverse impact on the aquatic ecosystem, including wetlands, and

b. meeting industrial development needs within the region.

3. Area 4 fills can only occur if Area 2 is fully developed and utilized. In addition, uses that may be proposed as a part of the Area 4 permit application must demonstrate that there are no other less environmentally damaging practicable locations for the use including the existing Bowerman Airfield area (Area 5).

4. Area 4 fills will be subject to approval through the Section 404 permit process. Unlike Areas 2, 3, 6 and 7 (in Management Unit 14) no prior Section 404 or Section 7 (Endangered Species Act) evaluations have been considered for this area within this plan on whether filling would have an unacceptable adverse impact. Consequently, proposals for Area 4 fill must demonstrate acceptable levels of impact on the ecosystem, the need for the proposed project which would be located on the fill, and alternative locations. As noted above, the actual location of an Area 4 fill which meets these requirements will depend on assessments at the time of proposal.

5. It is recognized that an Area 4 fill proposal may be submitted which meets needs and alternative requirements but cannot be located within this Management Unit due to unacceptable adverse impacts on the ecosystem. In such a case, it is expected that the Estuary Management Plan may be amended to accommodate necessary fill proposals (up to the total 500 acre limit) in other areas of the estuary and that the general area identified for the Area 4 fill will be redesignated as a natural area.

AREA 5 - EXISTING AIRFIELD - URBAN DEVELOPMENT

Description

Area 5, as identified in the Management Unit 12 exhibit is intended to describe the existing Bowerman Airfield area including all that land above the Section 404 Line of Non-Aquatic Vegetation, extending east to the Hoquiam City Limits line. In the area generally known as "the fan", the northern boundary of Area 5 is described by an east-west line, parallel to and 750 feet north of a line formed by the northern edge of the existing buildings on the Bowerman airfield. It is envisioned that this area will continue to be used for the existing airfield. At such time as the airfield is relocated, either to Area 3 or to another location, Area 5 will be used for water dependent industrial uses.

Implementation Conditions

The following special conditions have been developed in part with the conditions of Area 3.

1. Continuation of the existing use of this area is allowed subject to local land use regulations and other applicable local, state and federal requirements.

2. With the relocation of the airfield, either through its location in Area 3 or through its location elsewhere, the reuse of this area will be for water dependent industrial purposes.

3. If the airfield is relocated to an area other than Area 3, the subsequent reuse of Area 5 will be for uses whose dependency on the aquatic area can be accommodated through Area 6 only. No aquatic connections will be allowed into Area I from Area 5.

4. The relocation of the Airfield into Area 3 is intended to include only the runways with the fixed base facilities remaining in their present location. Reuse of Area 5 for water dependent industries will be in those areas vacated by the runways and other relocated facilities.

AREA 6 - WATERFRONT AREA - CONSERVANCY MANAGED

Description

This is the southern-most portion of the management unit extending from the Section 404 Line of Non-Aquatic Vegetation along the existing airfield out to the northern edge of the federal navigation channel. The area extends from the Hoquiam City Limits at the boundary between Management Units 12 and 14, westerly to the western-most extent of a potential fill in Area 4. The western boundary of Area 6 is not fixed at this time but is rather variable depending fill decisions made within Area 2 and 4.

Implementation Conditions

1. The southern shoreline of the existing Bowerman Airfield is an area of significant natural resources, particularly as it relates to the migration and feeding of fish and shellfish. At the same time, with the use of Areas 2 and 5, and potentially Area 4, for water dependent industrial development, access to the water and the navigation channel is of prime importance. Any development will be done with great care and under the following guidelines:

    a. A very limited number of "T" docks will be allowed within this area. The principal concern with these structures is the number of tressle connections to the shore rather than the length of dock structure at the navigation channel.

    b. Very limited filling is allowable at the approach to the "T" dock for the purposes of establishing a safe and efficient connection to the shore and, to reduce the high costs of such structures. Under no circumstances will such fills extend to that portion of the structure adjacent to the channel nor will it substantially interfere with the migration of fish and shellfish, or their rearing and feeding areas.

Do Not Scan

Reprep-Insert Do Not Scan Document Here

Document ID: Grays Harbor Estuary Management Plan

Page #: 69

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	
STRUCTURES	Piers, Docks, Wharves	*	
	Piling & Mooring Dolphins	*	
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing		
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 14
PLANNING AREA III

Management Category

UD - Urban Development

Boundary Description

Western Boundary - Management Unit 12, City of Hoquiam Boundary
Eastern/Study Boundary - Adams St., Burlington Northern Railroad out to line of Ordinary High Water.

Management Objectives

The uplands portion of this management unit will be one of the prime areas for continued heavy industrial expansion with an emphasis to water related and dependent uses. The bankline within this management unit is considered an important fish and shellfish migrating and feeding area. Any development within the bankline will be done with utmost care.

Special Conditions

The following special conditions will apply within this management unit:

1. A very limited number of "T" docks will be allowed within this Management Unit. The principal concern with these structures is the number of trestle connections to the shore rather than the length of the dock structure at the navigation channel.

2. Very limited filling is allowable on the approach to the "T" dock for the purposes of establishing a safe and efficient connection to the shore and, to reduce the high costs of such structures. Under no circumstances will such fill extend to the channel portion of the structure nor will it substantially interfere with the migration of fish and shellfish or their rearing and feeding areas.

MANAGEMENT UNIT 13

NOT USED

AREA 7 - HOQUIAM FILL
(See Management Unit 12 Exhibit)

Area 7 includes approximately 20 acres of land below the line of non-aquatic vegetation. This area, and much of the adjacent land is owned by the City of Hoquiam.

Implementation Conditions

The following special conditions have been developed in conjunction with the conditions of Area 1, Management Unit 12 and are tied, therefore, to their implementation.

1. When a permit is issued for fill in Area 7 for industrial development, fee title will be transferred for a portion of Area 1, Management Unit 12, on the basis of 3.4 acres transferred for each acre filled. The transfer will permanently establish a balance that is essential to avoid unacceptable adverse impacts to the aquatic ecosystem, including wetlands (within the meaning of Section 404 guidelines) that might result from future fills in Area 1, Management Unit 12. Transfer of the title will be done in accordance with Condition 3 of the Implementation Conditions for Area 1, Management Unit 12.

2. Filling in this area will be subject to approval through the Section 404 permit process. However, in the context of the total Management Unit and the total Estuary Management Plan, such filling is not considered to have an acceptable adverse impact on the aquatic ecosystem, including wetlands. In addition, the geographic location of this area, particularly its great distance from the authorized federal navigation channel, will be taken into account in permit determinations related to water dependency.

3. As filling occurs, it will be done in accordance with disposal practices approved through the permit process, including the use of containment structures surrounding each fill to preclude the unnecessary dispersal of fill material to the adjacent aquatic area. Although the plan views this area as a fill site, rather than a dredged materials disposal site, the use of dredged material for fill meeting these special conditions is appropriate.

MANAGEMENT UNIT 15
PLANNING AREA III

Management Category

UD - Urban Development

Boundary Description

Western Boundary - Management Unit 14
Eastern Boundary - The extension of Michigan Street to the shoreline
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water

Management Objectives

This area will serve as one of the principal areas for heavy industrial expansion for the Grays Harbor region. The emphasis on use will be for water related and dependent uses and redevelopment of already developed lands.

Special Conditions

1. Filling and/or development of the existing Port slips will be allowed subject to applicable local, state and federal regulations. Such filling however, is not considered to be an unacceptable adverse impact in the context of the total Estuary Management Plan.

2. Any other filling that may occur in this management unit also must meet applicable local, state and federal regulations. By so doing, it is not the intent of this plan to preclude the property owners from submitting proposals that might include the filling of areas adjacent to this management unit. However, in such circumstances, any proposal must demonstrate that the immediately adjacent uplands are (or will be) fully developed with water dependent uses; there are no practicable means of developing without such fill; and, a mitigation project (see Mitigation section) must be developed and approved by state and federal resource agencies in advance of permit approval, and an implementation schedule for the mitigation project committed to and initiated at the time of permit issuance.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges	●	
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	●	
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills	*	
	Bankline Straightening	●	
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	*	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

3. Navigation channel approach structures will be permitted. Limited filling will be permitted with the structure approach. The primary purpose of this filling is to cut the high costs of such a structure. State and Federal fish and wildlife agencies will review the proposed fill to ensure that there is a minimum intrusion on the fish and shellfish migration route.

4. A public boat ramp is believed appropriate within this management unit.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges	●	
	Causeways		
	Outfalls	●	
	Cable/Pipeline Crossing	●	
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins	□	
	Jetty		
	Special Project Fills		
	Bankline Straightening	●	
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 16
PLANNING AREA II/III

Management Category

UM - Urban Mixed

Boundary Description

Western Boundary - The extension of Michigan Street to the shoreline.
Eastern Boundary - Wishkah Railroad Bridge.
Study Area Boundary - Burlington Northern Railroad Line out to the line of Ordinary High Water.

Management Objectives

This Management Unit encompasses the area commonly known as the "Old Aberdeen Waterfront". Along with other areas in the harbor, this portion of the waterfront was the center of the historic industrial and commercial development in the harbor. Changing economic conditions have shifted the center of economic activity to other areas of the harbor, leaving this area in need of a major redevelopment effort. The management objectives for this unit recognize this need and are designed to support it with a range of use and activity options that allow flexibility in the siting and design, and can serve as a catalyst for the redevelopment effort.

MANAGEMENT UNIT 17
PLANNING AREA II

Management Category

UM - Urban Mixed

Boundary Description

Western Boundary - Wishkah River Railroad Bridge.
Eastern Boundary - western edge of oil storage facility.
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water.

Management Objectives

This area represents one of the few opportunities to "see the river" from the uplands. At the same time, it has limited opportunity for major development. The management unit will be used primarily for a mix of private and public uses that maximize the opportunities for water related enjoyment.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. A public park is proposed by the City of Aberdeen for passive and active waterfront recreation. Limited filling is allowable through the Bankline Straightening Policy. Some additional filling may be appropriate for this use, based on the normal 404 permit process and a review of detailed plans by state and federal agencies.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges	●	
	Causeways		
	Outfalls	●	
	Cable/Pipeline Crossing	●	
	Boathouses	□	
	Breakwater	□	
BANK	Diking	□	
	Bulkheading	□	
	Groins	□	
	Jetty		
	Special Project Fills		
	Bankline Straightening	●	
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	N
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges	●	
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	●	
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills	*	*
	Bankline Straightening	*	
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 18
PLANNING AREA II

Management Category

UD - Urban Development/Natural

Boundary Description

Western Boundary - Management Unit 17
Eastern Boundary - See Special Conditions below.
Study Area Boundary - Burlington Northern Railroad out to the line of Ordinary High Water.

Management Objectives

It is envisioned that this will be a heavy industrial area on the north side of the Chehalis River.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. No filling will be permitted along Elliott Slough below the line of non-aquatic vegetation (Section 404) or to within 100 feet of the line of Ordinary High Water.

2. Structures will be permitted to approach the navigation channel. Very limited filling is allowable at the approach to these structures for the purposes of establishing a safe and efficient connection to the shore, and to reduce the high costs of such structures. Under no circumstances will such fills extend to the channel portion of the structure nor will it substantially interefere with fish feeding areas or migration routes.

3. Bankline straightening may be appropriate in very limited circumstances within this management unit. The primary criteria for the application of bankline straightening will be to minimize effects on fish feeding and migration and to ensure that bankline straightening is essential to maintaining the function of the proposed use.

4. The accompanying figure is an enlarged version of the boundary between Management Units 18 and 19 as well as the special split that occurs within Management Unit 18. In addition to the designated management categories, the following conditions will also apply:

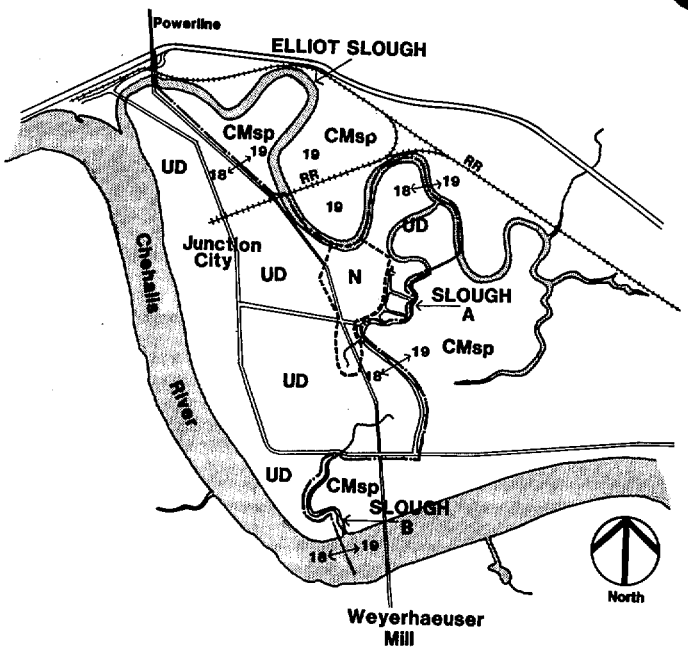
a. A 100 foot, no fill/no development buffer will be maintained along Elliott Slough and along both sides of the slough (designated Slough A) that intersects with Elliott Slough in the northeastern portion of the management unit.

b. A 50 foot, no fill/no development buffer will be maintained on both sides of the slough (designated Slough B) in the southern portion of the management unit, where that slough is north of the existing access road.

c. The existing access road in the area designated as Natural, can be maintained and up-graded to permit access to the Urban Development areas to the east.

d. The southernmost boundary between Management Units 18 and 19 is a line 50 feet west and parallel to Slough B, from its intersection with the existing access road to its intersection with Chehalis River.

5. Other fills above the bankline within the Urban Development portion of the Management Unit may be allowable consistent with applicable state and federal regulations.



PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls	*	
	Cable/Pipeline Crossing	□	
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 19
PLANNING AREA I

Management Category

CM - Conservancy Managed Special*

Boundary Description

Western Boundary - Management Unit 18 (also see map on previous page).
Eastern Boundary - a line approximately at the narrowest point between Chehalis River and the Burlington Northern Railroad line.
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water.

Management Objectives

This management unit is between the more intensely developed areas of Junction City and the more natural areas upriver. The long-term utilization of this area has not been determined by the estuary planning task force. In the short term, the area will remain in its present, somewhat undisturbed natural condition. Activities that hinder its natural characteristics, particularly its function as a natural water storage area, will not be permitted during this interim period.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1.* This management unit will automatically be reviewed by the estuary planning task force in their five year plan review. The purpose of this review will be to establish a final management classification for the management unit.

2. Any specific project proposals within this management unit will be reviewed by the estuary planning task force during their Annual Review.

3. A potential wastewater treatment plant will be permitted as a conditional use subject to local permit approval as well as review and consensus by the members of the Estuary Planning Task Force.

MANAGEMENT UNIT 20
PLANNING AREA I

Management Category

CM - Conservancy Managed

Boundary Description

Western Boundary - Management Unit 19
Eastern Boundary - the eastern extension of Mox Chuck Slough to Chehalis River
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water.

Management Objectives

This area will remain relatively undisturbed from its present natural condition. Continued use of the area for wildlife observation and hunting will be permitted. Activities that hinder its natural characteristics, particularly its function as a natural water storage area, will not be permitted.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions will apply:

1. A potential wastewater treatment plant will be permitted as a conditional use subject to local approval as well as to review and consensus by the members of the estuary planning task force.

2. Extraction of aggregate resources in areas outside the river is permitted.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls	*	
	Cable/Pipeline Crossing	□	
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.	*	
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UR	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	□	
	Boathouses	●	
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.	*	
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 21
PLANNING AREA I

Management Category

UR - Urban Residential

Boundary Description

Western Boundary - Management Unit 20
Eastern Boundary - west side of Higgins Slough.
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water.

Management Objectives

This is one of the few places in the river segment of Chehalis River where urban/suburban development is in close proximity to the river. Limited urban development will be permitted within this area. Additionally, this area can provide some limited opportunities for public access to the river. However, development of public access will be done to maintain compatibility with the natural characteristics of the management unit and adjacent areas.

Special Conditions

1. Extraction of aggregate resources in areas outside the river is permitted.

MANAGEMENT UNIT 22
PLANNING AREA I

Management Category

RA - Rural Agriculture

Boundary Description

Western Boundary - Management Unit 21
Eastern Boundary - west bankline of Wynoochee River.
Study Area Boundary - Burlington Northern Railroad line out to the line of Ordinary High Water.

Management Objectives

This area will continue to serve as one of the few agricultural areas within the study limits of the management plan. Additionally, the area will serve as one of the region's major extraction source of aggregate. However, activities associated with agriculture and aggregate extraction will be done to maintain compatibility with the natural characteristics of the area.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Extraction of aggregate resources in areas outside the river is permitted.

2. Maintenance of existing dikes will be allowed.

3. New dikes may be appropriate to protect agricultural land provided they meet applicable State and Federal regulations and do not encroach into wetlands.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RA	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins	□	
	Bridges	●	
	Causeways	□	
	Outfalls		
	Cable/Pipeline Crossing	□	
	Boathouses		
	Breakwater		
BANK	Diking	*	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.	*	
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins	□	
	Bridges	●	
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	□	
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.	□	
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 23
PLANNING AREA I

Management Category

RL - Rural Low Intensity

Boundary Description

Eastern Boundary - Confluence of Chehalis and Wynoochee Rivers.
Western Boundary - A point where the highway and Union Pacific Railroad line leave the parallel alignment of Chehalis River.
Study Area Boundary - Union Pacific Railroad line out to the line of Ordinary High Water.

Management Objectives

This management unit presently contains a scattering of single residences on mixed land parcels. Continuation and some expansion of these uses is seen as appropriate within the guidelines of Standard Uses and Permitted Activities. However, any development activities will be done to maintain compatibility with the natural characteristics of the management unit and adjacent areas.

Special Conditions

1. Extraction of aggregate resources in areas outside the river is permitted.

MANAGEMENT UNIT 24
PLANNING AREA I

Management Category

CM - Conservancy Managed

Boundary Description

Eastern Boundary - Management Unit 23
Western Boundary - a line at the eastern edge of the Weyerhaueser property in Section 24 (T17N, R9W).
Study Area Boundary - The Union Pacific Railroad line out to the line of Ordinary High Water.

Management Objectives

This management unit is similar in character and future use intent to Management Unit 20. Its relatively undisturbed, natural character will remain, with continued use for wildlife observation and hunting encouraged. Activities that hinder its natural characteristics, particularly its function as a natural water storage area, will not be permitted.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions will apply:

1. Continued maintenance and/or redevelopment of the South Bank Road and railbed will be permitted.

2. Reconstruction of the South Bank Road or construction of a new highway in the same approximate corridor alignment will be permitted. Specific plans for such a facility will be reviewed by the Estuary Planning Task Force.

3. Limited filling and erosion control measures will be permitted only as required for the reconstruction of the South Bank Road.

4. Extraction of aggregate resources in areas outside the river is permitted.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins	●	
	Bridges	*	
	Causeways	*	
	Outfalls		
	Cable/Pipeline Crossing	□	
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading	*	
	Groins		
	Jetty		
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control	*	
CHANNEL	New Access Channel		
	Channel/Berth Maint.	*	
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges	●	
	Causeways	✱	
	Outfalls	✱	
	Cable/Pipeline Crossing	✱	
	Boathouses	□	
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills	✱	
	Bankline Straightening	✱	
	Bankline Erosion Control	✱	
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 25
PLANNING AREA I/II

Management Category

UD - Urban Development

Boundary Description

Eastern Boundary - Management Unit 24.
Western Boundary - east side of Chehalis River Bridge.
Study Area Boundary - Union Pacific Railroad line, Burlington Northern Railroad line and the connection of the two spurs off of the Burlington Northern Railroad at the northern bend of Chehalis River out to the line of Ordinary High Water.

Management Objectives

This is an area of heavy industrial development. Existing uses will continue with an emphasis on redevelopment of old facilities and reutilization of existing sites. Some new expanded development is envisioned in the eastern portion of the management unit although it will be done in a way that recognizes the need for a transition to the more natural areas immediately upriver.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions will apply:

1. Maintenance of existing public boat ramps is permitted.

2. Fills in the eastern undeveloped areas of an upland character are permitted. Other fills within this management unit may be allowed provided they can meet applicable state and federal regulations. Specifically, bankline straightening may occur from the extension of "E" Street, up-river to the existing discharge channel with a priority for such fills in the area immediately adjacent to the pulp mill.

3. Construction of the South Aberdeen flood control project is consistent with the objectives of this management unit.

4. Cable and pipeline crossings, outfalls,

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	CM
STRUCTURES	Piers, Docks, Wharves	●	*
	Piling & Mooring Dolphins	*	*
	Bridges	●	●
	Causeways	●	
	Outfalls	●	●
	Cable/Pipeline Crossing	●	●
	Boathouses		
	Breakwater		
BANK	Diking	●	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control	□	□
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 26
PLANNING AREA II/IV

Management Category

UD/CM - Urban Development/Conservancy Managed

Boundary Description

Eastern Boundary - Management Unit 25
Western Boundary - the east bank of Chapin Creek.
Split Unit Boundary - the Burlington Northern Railroad line.
Study Area Boundary - the Burlington Northern Railroad line westerly to the line between Sections 16 and 17, T17N, R9W, thence southerly to the Westport Highway, following the highway west to the western management unit boundary.

Management Objectives

This is a particularly critical management unit in that it represents one of the future new industrial areas and yet contains critical vegetation to upriver fish migration and feeding. Additionally, two upland creeks with significant adjacent habitat traverse the area. Preservation of both features is the key to future use of this area.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions also apply:

1. On the landward side of the railroad line, heavy industrial development will be permitted consistent with the standard uses for the Urban Development classification. In the development of those areas, the riparian vegetation along Charley and Newskah Creek will be preserved (see also Conditions 6 and 7 below).

2. On the water side of the railroad line, limited development of inwater structures will be permitted in direct support of development within the Urban Development area.

3. Also within the Conservancy Managed area, on the water side of the railroad line, the existing treatment ponds and the Saginaw Mill site will be permitted to continue as will maintenance of the bankline of the treatment ponds and railroad line.

4. While development activity will be permitted throughout this management unit, the overriding interest is in the preservation of the existing salt marsh areas. Modification of those areas will only be possible as necessary to build structures or maintain banklines as specified in the preceding conditions.

5. Construction of the South Aberdeen flood control project is consistent with the objectives of this management unit.

6. A 50 foot, no fill/no development buffer (including roads) will be maintained along both sides of main stems of Charley and Newskah Creeks.

7. It is recognized that fills will be required in this management unit to accomplish its Urban Development objectives. It is also recognized that there are areas within this management unit that are, by definition, wetlands. Therefore fills, occurring in these latter areas that are done to meet the development objectives of this management unit must also meet the tests of applicable state and federal regulations.

MANAGEMENT UNIT 27
PLANNING AREA IV

Management Category

RL - Rural Low Intensity

Boundary Description

Eastern Boundary - Management Unit 26.
Western Boundary - state property boundary on the southern line of Section 36 (T17N, R11W).
Study Area Boundary - Burlington Northern Railroad line.

Management Objectives

Scattered residences exist throughout this general area although few, if any, exist on the water side of the railroad line. Continued development of this general character is considered appropriate in this management unit.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UD	CM
STRUCTURES	Piers, Docks, Wharves	●	✱
	Piling & Mooring Dolphins	●	✱
	Bridges	□	✱
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing	□	✱
	Boathouses	□	
	Breakwater		
BANK	Diking		
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	✱
CHANNEL	New Access Channel	□	
	Channel/Berth Maint.	□	
	Channel Realignment	□	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 28
PLANNING AREA IV

Management Category

UD/CM - Urban Development/Conservancy Managed

Boundary Description

Eastern (North) Boundary - Management Unit 27
Western (South/East) Boundary - Westport Highway to a line just east of the west line of Section 1 (T16N, R11W) to the intersection of the small slough with Johns River, approximately 800 feet east of the Westport Highway Bridge.
Split Unit Boundary - line of non-aquatic vegetation.
Study Area Boundary - the Burlington Northern Railroad line and the northern quarter section line of Section 1 (T16N, R11W), the northern boundary line of the Johns River Wildlife Recreation Area.

Management Objectives

This is one of the few industrial areas outside of the greater Aberdeen/Hoquiam area. The existing agricultural processing facility is seen as important to the continued viability of the region's cranberry crops. Continuation of that activity and other necessary supporting facilities is appropriate as are the present oyster plants. This is also an area of significant wetlands and thereby creates a potential for conflict. While the management philosophy expressed by the definition of Conservancy Managed appropriately fits this area, the permitted conditional uses of CM do not automatically fit the unique circumstances in this management unit and the adjacent uplands.

Special Conditions

In addition to the Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Maintenance of existing oyster docks and facilities is considered appropriate.

2. Development of a limited number of new docks and piers in direct support of adjacent, upland water dependent uses is

considered appropriate. Under such circumstances, special design and construction measures may be required to minimize destruction or modification of the wetlands.

3. A utility corridor for cable and pipeline crossing is permitted adjacent and parallel to the highway bridge.

4. Maintenance of the highway bridge and transportation corridor is allowed.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	N
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges	*	*
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 29
PLANNING AREA IV

Management Category

CM/N - Conservancy Managed/Natural

Boundary Description

Northern Boundary - Management Unit 28
Southern Boundary - the extension of Johns River Road
Split Unit Boundary - line of non-aquatic vegetation (Section 404)
Study Area Boundary - a line 200 feet landward from the line of non-aquatic vegetation or the boundary line of the Johns River Game Range, whichever is greater, including all of the water area to be western boundary of Management Unit 28.

Management Objective

The Johns River area is considered one of the prime natural areas in the estuary. This management unit will continue to support that designation and ensure that an adequate buffer exists to minimize any potential negative effects of activities on adjacent lands.

Some portions of this management unit have been diked and provide the definition for that area to be managed under a Conservancy designation.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Maintenance of the existing public boat ramp is permitted.

2. Maintenance of the bridge and transportation corridor is permitted.

MANAGEMENT UNIT 30
PLANNING AREA IV

Management Category

RL/CN - Rural Low Intensity/Conservancy Natural

Boundary Description

Eastern Boundary - Management Unit 29.
Western Boundary - east side of the intersection of Redman Slough with the estuary.
Split Unit Boundary - line of non-aquatic vegetation.
Study Area Boundary - the old railroad grade.

Management Objectives

This management unit will continue to serve as a low intensity rural area with scattered homes and generally sparse development. In addition, significant wetland areas exist within this management unit and will be preserved.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. A limited number of small private docks will be permitted in conjunction with upland residences.

2. Maintenance of existing boathouses is permitted.

3. A utility corridor for cable and pipeline crossing is permitted adjacent and parallel to the highway bridge.

4. Maintenance of the highway bridge and transportation corridor is allowed.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	CN
STRUCTURES	Piers, Docks, Wharves	●	*
	Piling & Mooring Dolphins		
	Bridges	●	*
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing	●	*
	Boathouses	□	*
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	*
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RA	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	*	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●
CONDITIONAL ACTIVITY □
SPECIAL CONDITIONS *

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 31
PLANNING AREA IV/VII

Mangement Category

RA - Rural Agriculture

Boundary Description

Eastern Boundary - Management Unit 30
Western (South) Boundary - the straight line extension of the east-west segment of the Westport Highway in Section 9 (T17N, R11W).
Study Area Boundary - shoreline management boundary.

Management Objectives

This management unit will continue to serve as an agricultural area with scattered farm homes.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Maintenance of existing dikes is permitted.

MANAGEMENT UNIT 32
PLANNING AREA VII

Management Category

RL - Rural Low Intensity

Boundary Description

Northern Boundary - Management Unit 31
Southern Boundary - southern line of Section 16 (T16N, R11W).
Study Area Boundary - Westport Highway.

Management Objectives

This area will continue to be used for scattered residences on mixed land parcels with a generally low intensity use character throughout.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Maintenance of existing dikes is permitted.

2. A limited number of small private docks will be allowed in conjunction with upland residences.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	
STRUCTURES	Piers, Docks, Wharves	*	
	Piling & Mooring Dolphins	*	
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	*	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	CM
STRUCTURES	Piers, Docks, Wharves	●	*
	Piling & Mooring Dolphins	●	*
	Bridges	●	*
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing	●	*
	Boathouses	□	*
	Breakwater		
BANK	Diking	□	
	Bulkheading	□	
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	*	*
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 33
PLANNING AREA VII

Management Category

UM/CM - Urban Mixed/Conservancy Managed

Boundary Description

Northern Boundary - Management Unit 32
Eastern Boundary - a line approximately 500 feet east of a local service road intersection with the shoreline at Beardslee Slough.
Split Unit Boundary - line of non-aquatic vegetation.
Study Area Boundary - Westport Highway and a line approximately 250 feet north of local service road on the east side of the highway.

Management Objectives

This small management unit ecompasses the unincorporated community of Bay City. By reason of its relationship to the Elk River Bridge and Westport Highway, it represents a good location for local highway service uses. The designation of this management unit as Urban Mixed will permit these activities to continue and will allow some limited expansion. It is not anticipated that the full range of Standard Uses permitted in Urban Mixed will be appropriate in this area.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. Small, private boat docks associated with upland residences are permitted.

2. A utility corridor for cable and pipeline crossing is permitted adjacent and parallel to the highway bridge.

3. Maintenance of the highway bridge and transportation corridor is allowed.

MANAGEMENT UNIT 34
PLANNING AREA VII

Management Category

CM/N - Conservancy Managed/Natural

Boundary Description

Eastern Boundary - Management Unit 33
Western Boundary - Westport Highway.
Split Unit Boundary - line of non-aquatic vegetation and all water area to the Westport Highway Bridge* (5).

Management Objectives

This is one of the significant natural areas in the estuary. The Elk River tideflats and water area contain some of the most significant wildlife populations and habitat. Classification of this as a natural area will not preclude its use for wildlife observation and hunting but will ensure that the natural characteristics are preserved. The management concept also establishes a buffer area around the natural designation to ensure maximum compatibility with adjacent uses.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions also apply:

1. While the intent of this management designation is to keep the area in a natural condition as it presently exists, continuation and limited expansion of certain existing uses and activities such as oyster culture is considered appropriate.

2. Stake and bottom oyster culture are permitted methods.

3. Limited raft oyster culture is considered appropriate.

4. Maintenance of existing boat ramps is permitted.

5. The Natural boundary extends to the bridge except as relates to the permitted uses and activities associated with Management Units 33 and 35.

6. Those activities permitted in Management Units 35 and 33 that require intrusion into this management unit are permitted provided they are done in a way that is consistent with the natural character and management objectives of this management unit and through the conditional use process.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	N
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins	□	
	Bridges	□	
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●
CONDITIONAL ACTIVITY □
SPECIAL CONDITIONS *

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	CM
STRUCTURES	Piers, Docks, Wharves	□	□
	Piling & Mooring Dolphins	●	□
	Bridges	●	*
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing	●	*
	Boathouses	□	*
	Breakwater	□	
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	*	*
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 35
PLANNING AREA VII

Management Category

UM/CM - Urban Mixed/Conservancy Managed

Boundary Description

Western Boundary - a line located 200 feet west of the intersection of the local service road and the Westport Highway, drawn generally north-south across the point of land at the west end of the Elk River Bridge.

Split Unit Boundary - line of non-aquatic vegetation.

Management Objectives

This management unit is similar in character and future use intent to Management Unit 33. It is designed as a small area of mixed urban uses taking advantage of its unique location at the highway and the bridge. It is not expected that this area will take on the intensity or full character of the Bay City side of the bridge. Several areas of significant wetlands exist within this management unit and will be preserved.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. A utility corridor for cable and pipeline crossing is permitted adjacent and parallel to the highway bridge.

2. Maintenance of the bridge and transportation corridor is permitted.

3. Maintenance of boathouses and skidways is permitted.

4. Rip-rap of existing bankline to protect permitted uses is considered appropriate.

MANAGEMENT UNIT 36
PLANNING AREA VII

Management Category

RL/CM - Rural Low Intensity/Conservancy Managed

Boundary Description

Southern Boundary - Management Units 34 and 35
Northern Boundary - Westerport city limits, generally defined by the half section line in Section 18 (T16N, R11W).
Split Unit Boundary - line of non-aquatic vegetation (Section 404).
Study Area Boundary - a line 200 feet landward from the line of non-aquatic vegetation (Section 404).

Management Objectives

This is somewhat of a transition management unit between the more natural areas to the south and the urban areas of Westport. The management philosophy of this unit preserves the shoreline area in a relatively undisturbed condition. The landward portion of the unit is intended to remain a low intensity use area.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	RL	CM
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		□
	Bridges		
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	■

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	CM
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways	□	
	Outfalls	□	□
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 37
PLANNING AREA VIII

Management Category

UM/CM - Urban Mixed/Conservancy Managed

Boundary Description

Southern Boundary - Management Unit 36
Northern Boundary - Pacific Avenue.
Split Unit Boundary - the line of non-aquatic vegetation (Section 404).
Study Area Boundary - a line approximately 200 feet landward of the line of non-aquatic vegetation.

Management Objectives

This management unit is intended to establish an eastern line of limitation for the expanding urban areas of Westport. There is considerable salt marsh in the eastern portion of the management unit and will be preserved in its natural conditions.

MANAGEMENT UNIT 38
PLANNING AREA VIII

Management Category

UM/CN - Urban Mixed/Conservancy Natural

Boundary Description

Southern Boundary - Management Unit 37
Northern Boundary - the line between the City of Westport Airport property and the lands owned by the Port of Grays Harbor. This line is further defined by a drainage ditch between the two properties.
Split Unit Boundary - the line of non-aquatic vegetation (Section 404).
Study Area Boundary - a line 200 feet landward of the line of non-aquatic vegetation.

Management Objectives

This management unit contains considerable salt marsh areas as well as the existing Westport Airport. Both uses are important to the local area and the regional economy and both will be preserved.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions also apply:

1. Filling to raise the existing Westport airfield is allowed in this management unit. The specific area of that fill is described by the drainage ditch on the east to a line perpendicular to the ditch that intersects the northeast corner of Lot 4, Block 6, in the plat of Chehalis, Section 7, T16N, R11W, to the south of the present airfield. Any filling must comply with appropriate permitting processes, including the Section 404 permit process. However, based upon current information, the raising of the airfield would not have an unacceptable adverse impact on the ecosystem, including wetlands.

2. Regarding the marina expansion project proposed in Management Unit 39, one of the important considerations in evaluating final design options will be the ability to obtain adequate flushing within the marina to maintain water quality conditions necessary to protect aquatic resources. It is possible that considering design options which would achieve better flushing characteristics, very

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	CN
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		□
	Bridges		
	Causeways		
	Outfalls	□	□
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking	□	*
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills	*	*
	Bankline Straightening		
	Bankline Erosion Control	□	*
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●
CONDITIONAL ACTIVITY □
SPECIAL CONDITIONS *

STANDARD USES See Standard Use Table

limited encroachment into Management Unit 38 might be considered. However, encroachment into Management Unit 38 will not be permitted if another alternative to protecting water quality for fisheries resources, such as artificial aeration or basin redesign, is feasible. Any suspected water quality problems must be clearly demonstrated through physical hydrolic modelling, mathematical modelling, or other appropriate methods. This determination will be made by EPA, Corps of Engineers and state and federal resources agency personnel at the time marina design options and alternative methods for maintaining water quality are evaluated. Mitigation would be required for any loss of wetlands within Management Unit 38.

MANAGEMENT UNIT 39
PLANNING AREA VIII

Management Category

UM - Urban Mixed

Boundary Description

Southern Boundary - Management Unit 38
Western Boundary - a point where the old railroad grade intersects with the shoreline of the western side of Point Chehalis.
Study Area Boundary - State Highway and Jetty Haul Road.
Eastern Boundary - the waterward boundary includes all of the water area of the existing marina and protective breakwater.

Management Objectives

This is the most intensely developed management unit in this portion of the estuary. It is designed to accommodate the major commercial and sport fishing requirements of the Westport area. Intensive use of the shoreline and backup areas is envisioned for both private and public activities.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions will also apply:

1. The new marina is permitted in the southeastern portion of the management unit.

2. The project is envisioned to involve a plan generally consistent with the size identified in Alternative 2, the Public Brochure released by the Corps of Engineers entitled, Alternatives and Their Pros and Cons, Small-Boat Basin, Grays Harbor, Washington, Area A - Westport, Draft #3, September, 1973. While such a project must meet applicable local, state and federal regulations, it is not considered an unacceptable adverse impact in the context of the total Estuary Management Plan.

   Filling as may be required by the Westport Marina Expansion Plan is

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	UM	
STRUCTURES	Piers, Docks, Wharves	●	
	Piling & Mooring Dolphins	●	
	Bridges		
	Causeways		
	Outfalls	●	
	Cable/Pipeline Crossing		
	Boathouses	●	
	Breakwater	●	
BANK	Diking	□	
	Bulkheading	*	
	Groins	●	
	Jetty	●	
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel	●	
	Channel/Berth Maint.	●	
	Channel Realignment	●	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

permitted including necessary reconstruction of existing docks, breakwater, or other existing facilities to permit optimum use of the existing marina.

4. Design options that are developed and evaluated as a part of the marina expansion permit may be constrained by factors in Management Unit 38. Prior to any final evaluations, the conditions and management objective of that Management Unit should be reviewed for compliance.

MANAGEMENT UNIT 40
PLANNING AREA VIII

Management Category

CM - Conservancy Managed

Boundary Description

Eastern Boundary - Management Unit 39
Western Boundary - the western terminus of the south jetty ruins.
Study Area Boundary - the Jetty Haul Road.

Management Objectives

This management unit is similar to Management Unit 1 and is intended for exclusive public recreational uses.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins	●	
	Jetty	●	
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	●	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	◉

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	N	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY ●
CONDITIONAL ACTIVITY □
SPECIAL CONDITIONS ✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 41
PLANNING AREA V

Management Category

N - Natural

Boundary Description

The general zone around Goose and Sand Islands, specifically the Department of Natural Resources' Scientific Preserves plus an area equal to an additional ½ mile around the islands.

Management Objectives

This area is intended as a natural area exclusively for wildlife habitat enhancement and preservation.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions apply:

1. Bed type oyster culture is permitted.
2. Commercial fishing is permitted.

MANAGEMENT UNIT 42
PLANNING AREA IV

Management Category

CN - Conservancy Natural

Boundary Description

The general zone known as Whitcomb Flats.

Management Objectives

This area is designed to remain undisturbed. The area contains some valuable oyster beds, however, which will continue to be viewed as an important resource for protection and harvesting.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following special conditions will also apply:

1. While this management unit is to remain predominantly undisturbed, continued use of the area for oyster culture and commercial fishing is permitted.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CN	
STRUCTURES	Piers, Docks, Wharves		
	Piling & Mooring Dolphins		
	Bridges		
	Causeways		
	Outfalls		
	Cable/Pipeline Crossing		
	Boathouses		
	Breakwater		
BANK	Diking		
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves	□	
	Piling & Mooring Dolphins	●	
	Bridges		
	Causeways		
	Outfalls	□	
	Cable/Pipeline Crossing	●	
	Boathouses		
	Breakwater		
BANK	Diking	□	
	Bulkheading		
	Groins		
	Jetty		
	Special Project Fills		
	Bankline Straightening		
	Bankline Erosion Control	□	
CHANNEL	New Access Channel		
	Channel/Berth Maint.		
	Channel Realignment		

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	✱

STANDARD USES See Standard Use Table

MANAGEMENT UNIT 43
PLANNING AREA III

Management Category

CM - Conservancy Managed

Boundary Description

The Rennie Island area including the dredge spoils island to the west out to the line of Ordinary High Water.

Management Objectives

This area has served as a dredge materials disposal area and as a waste treatment pond for many years. While dredge spoiling will continue in the area for some time, the long term use will be for wildlife and water fowl habitat enhancement and development.

There may be opportunity to use dredged materials in this area to develop marsh habitat through experimental management programs.

Special Conditions

In addition to Standard Uses and Permitted Activities, the following conditions will also apply:

1. In the area currently used for waste treatment ponds, inlet pipes and outfall structures may continue to be used in support of requirements of state and federal waste discharge permits.

2. The disposal of dredged materials will be permitted to continue in those areas presently authorized.

3. Experimental resource utilization and habitat development programs such as those currently available through the Corps of Engineers may be pursued subject to design and review by state and federal resource agencies.

MANAGEMENT UNIT 44
PLANNING AREA

Management Category

CM - Conservancy Managed

All the water and tideland area waterward of the Ordinary High Water Line not included in other designated management units (see Special Conditions below also).

Management Objectives

This special management unit includes all the remaining area within the study area of the estuary management plan not covered by other management units. It is essentially all the water area and is intended to be managed for multiple uses within an overriding "conservancy" designation. The conservancy designation is designed to protect areas for purposes that directly use or depend on natural systems. Activities which occur in the estuary should therefore be compatible with those natural systems in order to maintain the carrying capacity and biological productivity of the bay. Because those systems are easily upset by man-made disturbances, special conditions are imposed to ensure that activities are carried out in a manner which does not reduce or degrade these estuarine resources.

Special Conditions

1. Activities in Unit 44 should be compatible with the natural system. For example, areas of significant fish and wildlife habitat should be managed to ensure continued biological productivity. Where consistent with resource capabilities, high-intensity water-dependent recreation, dredging, and other water-dependent uses are to be provided for. Thus, those uses that depend on the water area (e.g., shipping and fishing) and the activities that support those uses (maintenance dredging, navigation aids, etc.) are generally considered appropriate to the Management Unit. While the definition of Conservancy Managed is appropriate to this management unit, the set of Standard Uses normally assigned to this category are not. Therefore, a special column is added to the Standard Use Table on Page 109 for Management Unit 44.

PERMITTED ACTIVITIES

	MANAGEMENT CATEGORY	CM	
STRUCTURES	Piers, Docks, Wharves	*	
	Piling & Mooring Dolphins	□	
	Bridges		
	Causeways		
	Outfalls	*	
	Cable/Pipeline Crossing	*	
	Boathouses	*	
	Breakwater	*	
BANK	Diking		
	Bulkheading		
	Groins	*	
	Jetty	*	
	Special Project Fills	*	
	Bankline Straightening		
	Bankline Erosion Control		
CHANNEL	New Access Channel	*	
	Channel/Berth Maint.	●	
	Channel Realignment	*	

PERMITTED ACTIVITY	●
CONDITIONAL ACTIVITY	□
SPECIAL CONDITIONS	*

STANDARD USES See Standard Use Table

APPENDIX A

STANDARD USE MATRIX

2. All new allowable or expanded on-site existing uses occurring within Management Unit 44, that by their nature are independent from direct upland support (except by authorized federal navigation projects) and that require a construction permit, are considered conditional uses by this plan.

3. Uses permitted in shoreline management units that are water dependent/related and/or require some form of access into Management Unit 44 as a direct support for that shoreline use are permitted in Management Unit 44 only to the extent necessary to provide that access and/or only to the extent covered in other Special Conditions.

4. Experimental resource utilization and habitat development programs such as those currently available through the Corps of Engineers may be pursued provided that such programs would not interfere with uses and activities allowed in adjacent management units. Any such programs will be subject to review and approval by state and federal resource agencies.

5. Extraction of aggregate resources in Chehalis River above Cosmopolis is permitted under the following conditions:

   a. The extraction of aggregate as a part of channel and berth maintenance is allowable.

   b. Extraction of aggregate within the river but not as a part of channel maintenance may be allowed providing that:
   1) there are no alternative sources of aggregate within the general Montesano, Aberdeen, Hoquiam, or Cosmopolis area; 2) water quality standards can be met; 3) there will be no adverse impacts on fish habitat or seasonal fish runs.

8. Realignment or improvement of the authorized federal navigation channel is neither permitted nor prohibited by this plan. Instead, such activities will be considered through existing procedures.

STANDARD USES

● PERMITTED USE

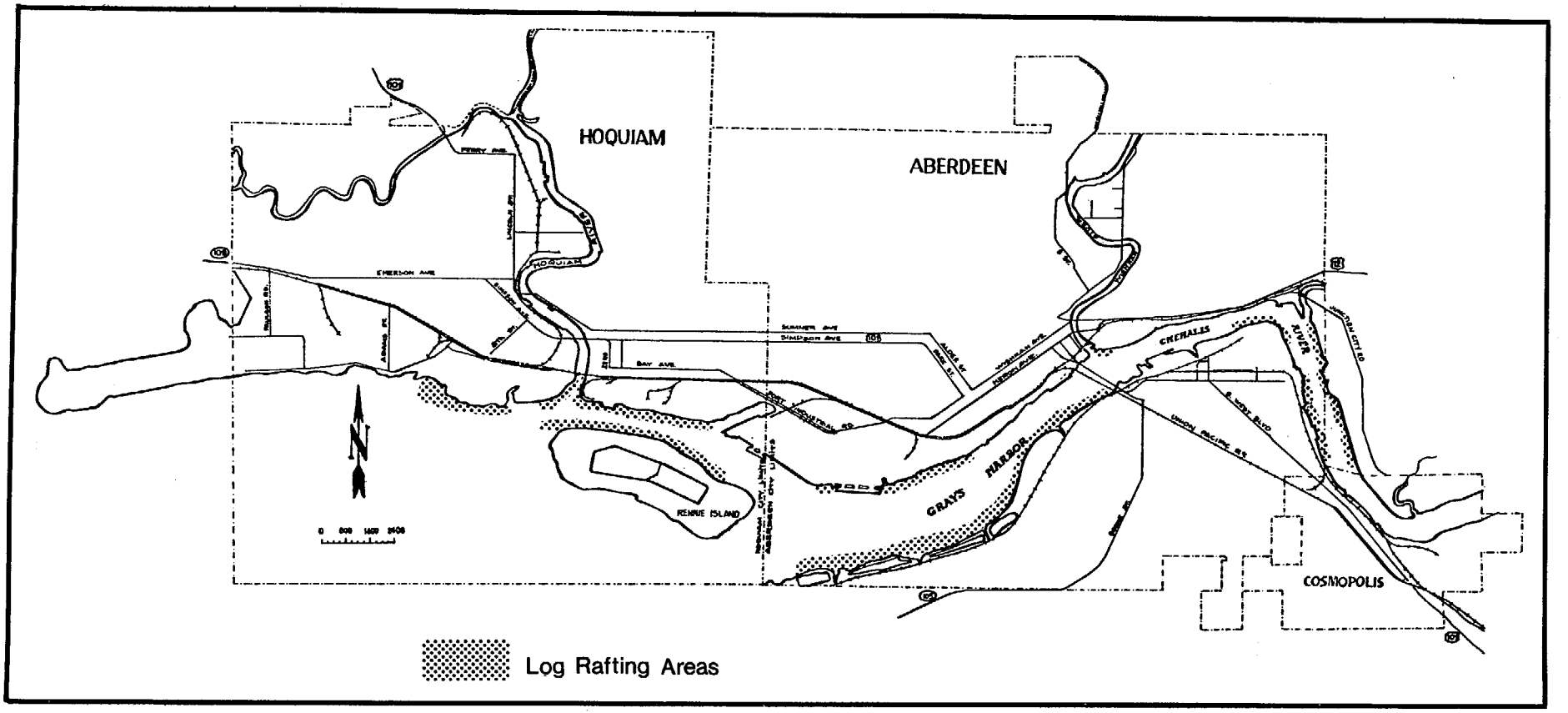
□ SEE SPECIFIC MANAGEMENT UNIT GUIDELINES

	USE CATEGORY	NATURAL	CONSERVANCY		RURAL		URBAN			MANAGEMENT UNIT NO. 46
		N	CN	CM	RL	RA	UR	UD	UM	CM
PORT FACILITIES	Dock and Warehouse Facilities						□	●	●	□
	Port Terminal Facilities							●	□	□
	Ship Berthing							●	□	□
	Barge Berthing							●	□	□
	Ship Construction and Repair							●	□	□
	Navigational Aids	□	□	●	●	●	●	●	●	□
MANUFACTURING AND OTHER	Heavy Industry							●	□	
	Light Industry						□	●	●	
	Water Dependent Industry						□	●	●	□
	Forest Products Processing							●	□	
	Mineral Extraction and Storage			□	●	●		●	□	□
TRANSPORTATION	Ferry Terminal			□	●	●	●	●	●	□
	Shipping				●	●	●	●	□	□
	Roads and Railroads		□	□	●	●	●	●	●	
	Airports				□	□	□	●	●	
	Overhead Utility Corridor		□	□	●	●	●	●	●	□
	Submerged Utility Corridor		□	□	□	□	●	●	●	□
FOOD INDUSTRY	Commercial Fishing (Incl. Shellfish)	□	●	●	□	□				□
	Oyster Culture	□	●	●	□	□				□
	Aquaculture	□	●	●	□	□		●	●	□
	Fish and Food Processing			□	□	□	□	●	●	□
COMMERCIAL	Motel						●		●	
	Boat Sales, Construction and Repair						●	●	●	□
	Restaurant				●	□	●		●	
	Marina				□		●	●	●	□
	Other Commercial						□		●	
RECREATION	Public Fishing Areas	●	●	●	●	●	●	●	●	□
	Water Dependent Hunting	●	●	●	●	●				□
	Pleasure Boating	●	●	●	●	●	●	●	●	□
	Camping		□	●	●	□	□		□	
	Public Boat Ramp		□	●	●	□	●	●	●	□
	Park/Parkway, Other Public Access			□	●	□	●	●	●	□
RESIDENTIAL	Floating Homes						□		□	□
	Urban/Suburban						●		●	
	Rural Low Intensity (Scattered)			□	●	□	●			
	Rural Agricultural (Farm House)			●	□	●				
AGRICULTURE	Major Cultivated Crops					●				
	Passive Agriculture			●	●	●				
	Subsistence/Local Market Farming		□	●	●	●				
	Tree Farm		□	●	●	●				
NATURAL AREAS	Estuarine and Marine Sanctuaries	●								□
	Wildlife Refuges	●	●	●	●					□
	Living Resource Production and Habitat	●	●	●	●	●	●	●	●	□

APPENDIX B

AREAS USED FOR LOG RAFTING

AREAS USED FOR LOG RAFTING
GRAYS HARBOR ESTUARY



Source: Based on Washington State Department of Natural Resources
Log Rafting Leases as of 1/4/83
1975 and 1979 Aerial photographs

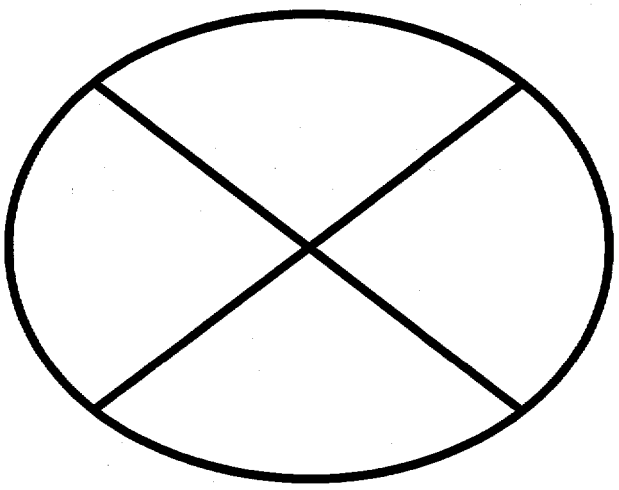
GHRPC/1.12.1983

APPENDIX C

GRAYS HARBOR ESTUARY MANAGEMENT PLAN

PLANNING AREAS AND MANAGEMENT UNITS

Do Not Scan



Reprep-Insert Do Not Scan Document Here

Document ID: Grays Harbor Estuary Management Plan

Page #: 1 (Between Appendix C & Appendix B

APPENDIX B

FEDERAL AGENCIES LETTERS OF INTENT

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

CZM
RECD.

1982 NOV 29 AM 10: 11

MAIL ROOM

REPLY TO ATTN OF: M/S 423

NOV 22 1982

Donald Moos, Director
Washington Department of Ecology
Mailstop PV-11
Olympia, Washington 98504

RE: Grays Harbor Estuary Management Plan

Dear Mr. Moos:

This letter of intent is provided to develop an understanding on how EPA intends to use the Grays Harbor Estuary Management Plan (GHEMP). We understand the plan will be amended into the local Shoreline Management Master Program for the county and incorporated cities with jurisdiction in the estuarine area, and adopted as state regulations by the Department of Ecology under the Shoreline Management Act.

The GHEMP was developed with the participation and consensus of the various local, state, and Federal agencies responsible for estuarine resource development and preservation in the area. By bringing together these entities, it was hoped that a common set of goals and objectives could be developed which took into account the respective authorities and standards of each jurisdiction. The GHEMP provides a mechanism to reach balanced decisions regarding necessary development and preservation of natural resources in the estuary. As a result, time delays in obtaining permits should be significantly reduced.

The Environmental Protection Agency (EPA) participated in the planning process by virtue of its role in the Section 404 dredge and fill permit program administered by the U. S. Army Corps of Engineers. Under Section 404 of the Clean Water Act, EPA recommends to the Corps actions necessary for the protection of water quality and associated beneficial uses, including municipal water supplies, shellfish beds and fishery areas, wildlife, and recreation areas. EPA believes that protection of water quality and related uses has been incorporated into the GHEMP on an estuary-wide basis, and in some cases on a site-specific basis. As a result, EPA intends to use the GHEMP in our permit review evaluation in conjunction with our Section 404(b)(1) regulatory guidelines.

EPA is unable to commit ourselves to planning recommendations for specific projects in advance of actual permit application. The nature of Federal legislation is such that existing laws and environmental criteria may change, which precludes our prejudging project proposals until they become actual permit applications. Current examples of this are reauthorization of the Clean Water Act and revision of the 404(b)(1) guidelines. Project proposals must, therefore, be evaluated at the time of permit application under then existing requirements.

We recognize that planning under the State of Washington Shoreline Management Act is a necessary and worthwhile activity. Development of the GHEMP has certainly been a commendable effort. We have appreciated the opportunity to work on the GHEMP and look forward to its successful implementation.

Sincerely,

John R. Spencer
Regional Administrator

January 5, 1982

Donald W. Moos, Director
Washington Department of Ecology
Olympia, Washington 98504

Dear Mr. Moos:

The Fish and Wildlife Service has been actively involved in the Grays Harbor Estuary Management Plan (GHEMP) for several years. We have supported the development of GHEMP because it provides predictability to development interests while providing long-term protection for important natural resources.

The key concept upon which the GHEMP is premised is balance. This "balance" must be maintained through reasonable interpretation of the plan, as well as, through any changes which may occur to the plan in the future.

This Service intends to use the GHEMP as an important tool for making decisions and recommendations in the Grays Harbor area. The plan provides good general guidance for the various management units, although it could not, of course, predict specific projects or activities which might take place. Therefore, we will continue to evaluate projects through the normal permit process, as explained on page 5 of the plan. We believe that our permit review will be facilitated since much of our normal permit evaluation criteria has been incorporated into the plan.

We believe that the GHEMP is a significant step toward maintaining the biological productivity and enhancing the economic productivity of the Grays Harbor Estuary, and look forward to participating in its implementation.

Sincerely,

Original signed by
Joseph R. Blum

Joseph R. Blum
Assistant Regional Director - Environment

cc: ES Olympia

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Office of the Regional Director
7600 Sand Point Way, NE
BIN C15700, Seattle, WA 98115

OFM
RECD.
JAN 1983 JAN -6 AM 10: 22
MAIL ROOM

F/NWR5:JVW

Mr. Donald Moos, Director
Washington Department of Ecology
Mailstop PV-11
Olympia, Washington 98504.

Dear Mr. Moos:

I have enclosed an unsigned draft letter describing how the National Marine Fisheries Service intends to use the Grays Harbor Estuary Management Plan (GHEMP). When the GHEMP is final, after the full review process, the enclosed letter would be signed and reference the appropriate final plan date.

Some plan changes may be made as a result of the forthcoming public (and agency) plan and Environmental Impact Statement review process. If major changes are proposed, the Task Force should be reconvened to consider them.

The Washington Department of Ecology has played a key role in facilitating the completion of the GHEMP. This planning effort constitutes a remarkable example of coordination and cooperation between local, State and Federal agencies. We look forward to working with your agency to ensure successful plan implementation.

Sincerely yours,

Original Signed by
H. A. Larkins

H.A. Larkins
Regional Director

Attachment

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E.
Seattle, Washington 98115

F/NWR5:JVW

DRAFT

Mr. Donald Moos, Director
Washington Department of Ecology
Mailstop PV-11
Olympia, Washington 98504

Re: Grays Harbor Estuary Management Plan (date)

Dear Mr. Moos:

The Grays Harbor Estuary Management Plan (GHEMP) is a landmark document developed with the participation and consensus of the various local, State and Federal agencies responsible for development, resource conservation, and preservation. By bringing together all of these entities, their respective authorities and standards were to a very great extent reconciled with each other. As a result the plan provides increased predictability for the community and the agencies regarding development and natural resources protection. The GHEMP provides a blueprint for economic growth balanced with provisions for the protection of the natural features of the bay area.

As you are aware, the National Marine Fisheries Service (NMFS) is charged with the protection, development and enhancement of marine, estuarine, and anadromous fishes and the habitat on which they depend. The NMFS participated in the GHEMP Interagency Task Force in a coordination role as provided by Section 307 of the Coastal Zone Management Act. We expect that the GHEMP will expedite our review of Corps of Engineers Section 10 and 404 permit applications (provided for in the Fish and Wildlife Coordination Act) for the Grays Harbor area. We believe that an acceptable level of fishery habitat protection has been incorporated into the GHEMP on an estuary-wide basis and in some cases on a site-specific basis. We therefore intend to use the GHEMP in preparing permit comments for the Corps of Engineers.

As noted in the GHEMP (page 5), the plan does not bypass the Corps permitting process, nor any of the Section 404(b)(1) criteria used in commenting on a permit. Yet through the direct involvement of the permitting and reviewing agencies in the planning process, development has been designated for those areas where Federal permits are most likely to be issued. Conversely, certain kinds of development have been excluded from those areas where Federal permits are most likely to be denied. Without specific project and design details it was of course not always possible to do complete advance permit evaluations for development in given locations (management units). Full satisfaction of the Section 404 Guidelines must logically be demonstrated through the permit application at the time a project is proposed. Yet the permit criteria in the Section 404 guidelines have been evaluated in a broad sense as one basis for designating a given management unit's "category" (e.g. natural, conservancy managed, urban development, etc.).

There are four major classes of activities addressed by the GHEMP, each with different consequences for Federal permit decisions. The "permitted activities" tables for each management unit depict all four classes. The tables list "permitted" activities authorized under the plan which are most likely to meet Federal permit criteria. The tables also list activities "conditionally permitted" by the plan which will likely meet Federal permit criteria only if special care is taken to avoid negative environmental impacts through specific project/site conditions. These specific conditions will be developed in pre-permit or permit consultation with the appropriate resource agencies, including NMFS. Some other activities are identified in the "permitted activities" tables as "special condition" uses. These activities are authorized under the plan only if they incorporate the "special conditions" listed in the plan which were designed to reflect unique characteristics and needs of each management unit. The special conditions in the plan were developed with reference to Federal permit criteria whenever practicable; e.g., in some management units, the special conditions reflect an evaluation of acceptable (or unacceptable) impact on the aquatic ecosystem. Finally, activities not authorized by the plan (depicted by blanks in the "permitted activities" and "standard uses" tables) will generally result in a negative permit recommendation. To the extent that Federal permit criteria have been addressed in the GHEMP, this agency will follow the guidance in the plan, including the management objectives for each unit, in commenting on Corps of Engineer's permits.

The consensus decision-making process of the Task Force evolved through numerous compromises and resulted in a careful balance between development and resource protection. Our reliance upon the GHEMP in permit review is predicated on maintaining this balance. As a result, plan amendments which could alter this balance should be carefully reviewed by the Task Force so that continued use of the GHEMP is possible.

We genuinely hope and expect that the GHEMP will facilitate growth and development in appropriate areas of Grays Harbor while ensuring long-term protection for the productivity, fish, and wildlife of the estuary.

Sincerely,

DRAFT

H.A. Larkins
Regional Director

cc: Office of Ocean and Coastal Resource Management

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

NPSOP-NP

Donald Moos, Director
Washington State Department of Ecology
Mailstop PV-11
Olympia, WA 98504

Dear Mr. Moos:

This letter responds to Mr. Don Peterson's proposed draft of a Memorandum of Understanding for Implementation of Grays Harbor Estuary Management Plan. Rather than modify the draft Memorandum to our satisfaction, I submit the following as our intentions:

a. The Seattle District supports incorporation of the Plan into the State Coastal Zone Management Plan.

b. Although the Seattle District cannot agree to use certain portions of the Plan as the sole basis of findings and documentation for our actions, the Plan will be a part of our evaluation process.

c. As required by law, permits for work in navigable waters and also adjacent wetlands will be denied, where within 6 months, the State declares that a proposal is inconsistent with the Washington Coastal Zone Management Plan and this determination is not overridden by the Secretary of Commerce.

d. The Seattle District is willing to participate in the amending of the Plan if requested by the State.

Incorporation of the Plan into the State Coastal Zone Management Plan will culminate many years of effort by a number of public agencies and private individuals. Providing predictability for future uses of this estuary has been our ultimate goal and the Seattle District has been and continues to be a strong supporter of this concept. As this Plan represents the spirit of cooperation that exists amongst us, we look forward to its implementation.

Sincerely,

NORMAN C. HINTZ
Colonel, Corps of Engineers
District Engineer

APPENDIX C

MANAGEMENT UNIT 12 - IMPACTS ON BOWERMAN BASIN

APPENDIX C

MANAGEMENT UNIT 12 - BOWERMAN BASIN & ENVIRONS
Special Impact Analysis

A. GENERAL

1. Management Unit (MU) 12 consists of the Bowerman Airfield peninsula, approximately 2200 acres of Port of Grays Harbor owned marsh and tidelands and some subtidal lands, and tidelands extending from the south of the peninsula to the navigation channel (see photo C-1). The area is further divided into areas commonly referred to as Moon Island, Minimoon Island (or formerly dredge disposal site E), the Bowerman Basin and the Moon Island Tideflats to the west of the Basin (see photo C-2). For management purposes, the unit has been divided by area designators (Area's 1 through 6 in MU 12, and Area 7 in MU 14) in the plan (see figure C-1).

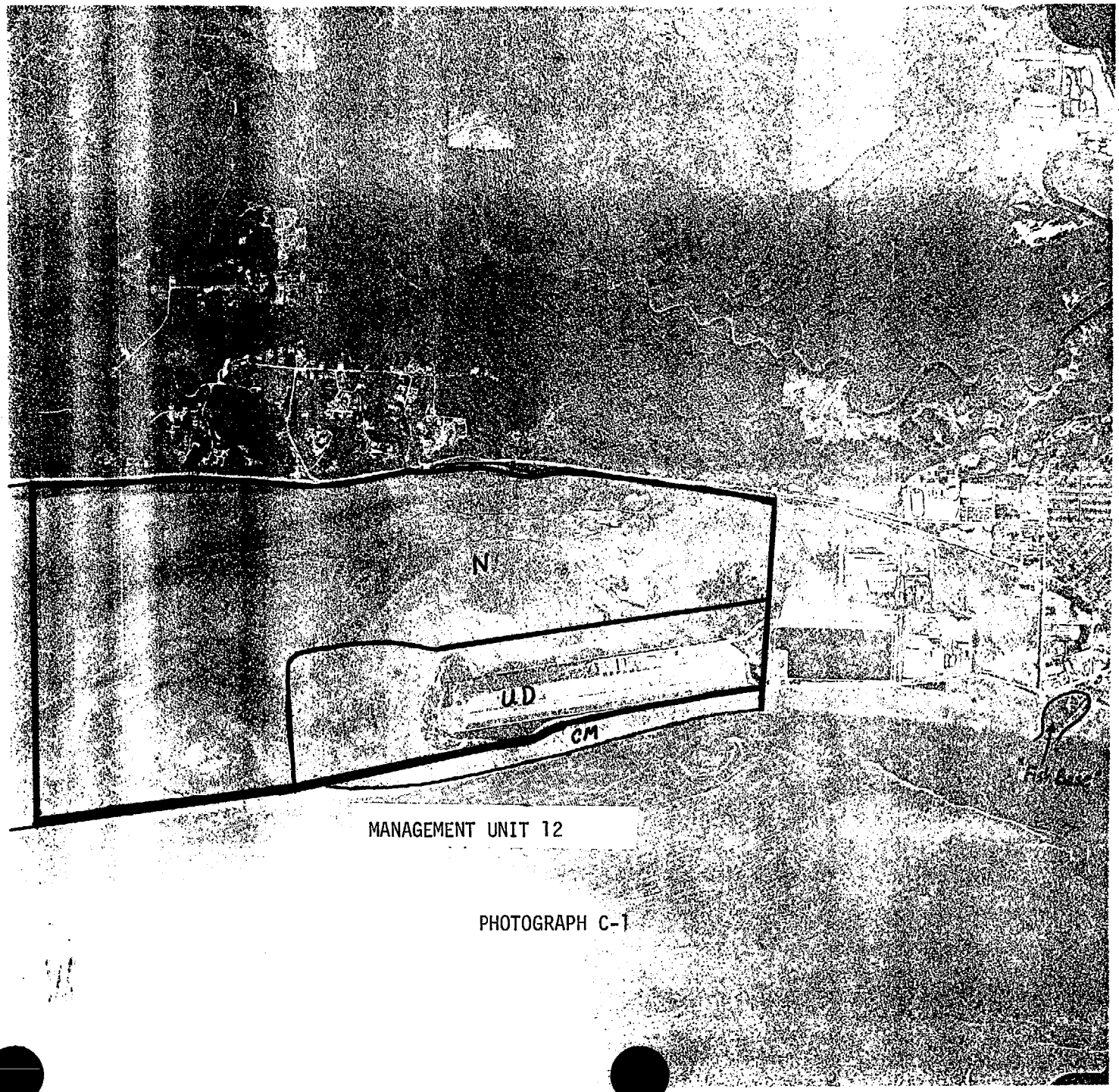
2. It is this MU (particularly that area known as the Bowerman Basin) more than any other which has become the focus of both controversy and concern during the development of the GHEMP and the NEPA scoping process. This area has been identified as being essential to the future economic needs of the region to provide suitable land for water dependent industrial development and also clearly identified as an essential site for shorebirds and peregrine falcons. Therefore, this section of the PDEIS will take a closer look at the environment, the proposed actions which the plan contemplates and the potential consequences of those actions to the natural environment should they occur (i.e., the consequences to the socio/economic environment are discussed in Part IV). This section has been included as an appendix only because of its length and focus on a particular subject and is not intended to diminish its importance from the rest of the EIS.

3. It is not possible to fully or accurately describe all the impacts at this time for a diversity of reasons including: lack of knowledge of timing of the proposed actions, new information which may come to light from monitoring activities and the uncertainty associated with predicting impacts on dynamic bird populations. Nevertheless, some conclusions can be drawn at this time prior to any action taking place. This information (as well as any new information) will be presented, reviewed and added to through the existing permit process prior to any approval to discharge dredged or fill materials into the aquatic lands of MU 12.

B. DESCRIPTION OF THE ENVIRONMENT

1. Physical

a. Bowerman Basin, a section of the estuary, is located on the northern shore of the inner harbor approximately 8 miles east of the mouth of the harbor. The basin is bordered on the north by Highway 109, on the south by the Bowerman Airfield peninsula, and on the east by Paulson Road connecting the peninsula to Highway 109. Prior to the construction of the road, the Basin extended farther eastward. The remaining wetlands west of the road are owned by the City of Hoquiam and designated as Area 7 in MU 14. The west end of the Basin opens into the inner harbor portion of the estuary. The western boundary



MANAGEMENT UNIT 12

PHOTOGRAPH C-1

Photograph C-2. Management Unit 12

NORTH

WILSEY & HAM

MANAGEMENT UNIT 12

BOWERMAN BASIN

GRAYS HARBOR ESTUARY MANAGEMENT PLAN
GRAYS HARBOR REGIONAL PLANNING COMMISSION

FIGURE C-1

of the Basin is hard to set for purposes of shorebird use but is normally defined by a man-made, nonfunctional trestle line extending from the western portion of the peninsula northward. The boundary therefore, includes approximately 500 acres of aquatic lands. Bowerman Airfield was developed by the Navy during World War II by placing dredged material disposal within the confines of a bulkhead. It was originally connected to the mainland by a trestle and was known as Moon Island. During the 1940's dredge material disposal was placed in the area east of the field connecting it to the mainland, to form an east-west trending peninsula. Uncontained dredged material disposal at the eastern side of the Basin continued in a westerly direction until 1972. Since 1972, dredged material disposal placed in the area has been confined behind dikes (Lattin, pers. comm. 1980). Thus the area has been substantially modified over the years through diking, dredged material disposal, filling and sundry land uses. It has been estimated that as much as 1600 acres of aquatic habitat have been used for dredged material disposal since 1940 in areas west of the Hoquiam River to Minimoon Island (Herman 1978). The area to the west of the Airfield has been completely modified through the discharge of dredged material disposal over a long term. Disposal in this area has been halted since 1976. The impacts of these former discharge activities have been described in significant detail in a Corps of Engineers publication entitled "Maintenance Dredging and the Environment of Grays Harbor - Appendices A-N."

b. Unconfined disposal has covered the basin with a layer of predominately fine grained material dredged from the inner harbor channel (Corps, App. F 1976). Figures C-2 and C-3 show the different types of sediments and grain sizes for the estuary and MU 12. These show that MU 12 consists mainly of intertidal mudflats (as opposed to sandflats). The sediment character of the Bowerman Basin consists mostly of silty clay fringed by silty sand. Sediment type and grain size is important to the types of benthic invertebrates which inhabit the estuary, and consequently important to the shorebirds.

c. The elevation of the Basin has been raised as a result of the discharge of unconfined dredged material disposal (Corps, App. F, 1976). Tidal channels created by water draining off the flats at low tide can be seen draining water from east to west and near Mini-Moon Island from south to northwest indicating a predominant drainage pattern. Protected from major wave attack by the peninsula, the tides have carried the materials back and forth to provide a gradual sloping which appears to be advantageous to the shorebirds because it provides a longer period of time in which to feed on the mudflats (Herman 1978). Figure C-4 shows a topographical map of the estuary. Tideflats between an elevation of +5 feet above mean sea level to +9 feet are shown in black, thereby providing a comparison of tideflats which may be available for the lastest and earliest feeding periods for the shorebirds. Bowerman Basin is not necessarily unique in having extensive mudflats for late feeding but it does appear to be the latest part of the estuary to be inundated at high tide, consequently providing the longest feeding period (1-2 hours) (Herman 1978).

2. Vegetation

a. The basin includes 450 acres of intertidal area fringed on the north, east, and south by 90 acres of salt marsh, grass lands, and scattered trees. The west end of the peninsula is vegetated by bentgrass (*Agrostis alba*), American dunegrass (*Elymus mollis*), tufted hairgrass (*Deschampsia cespitosa*),

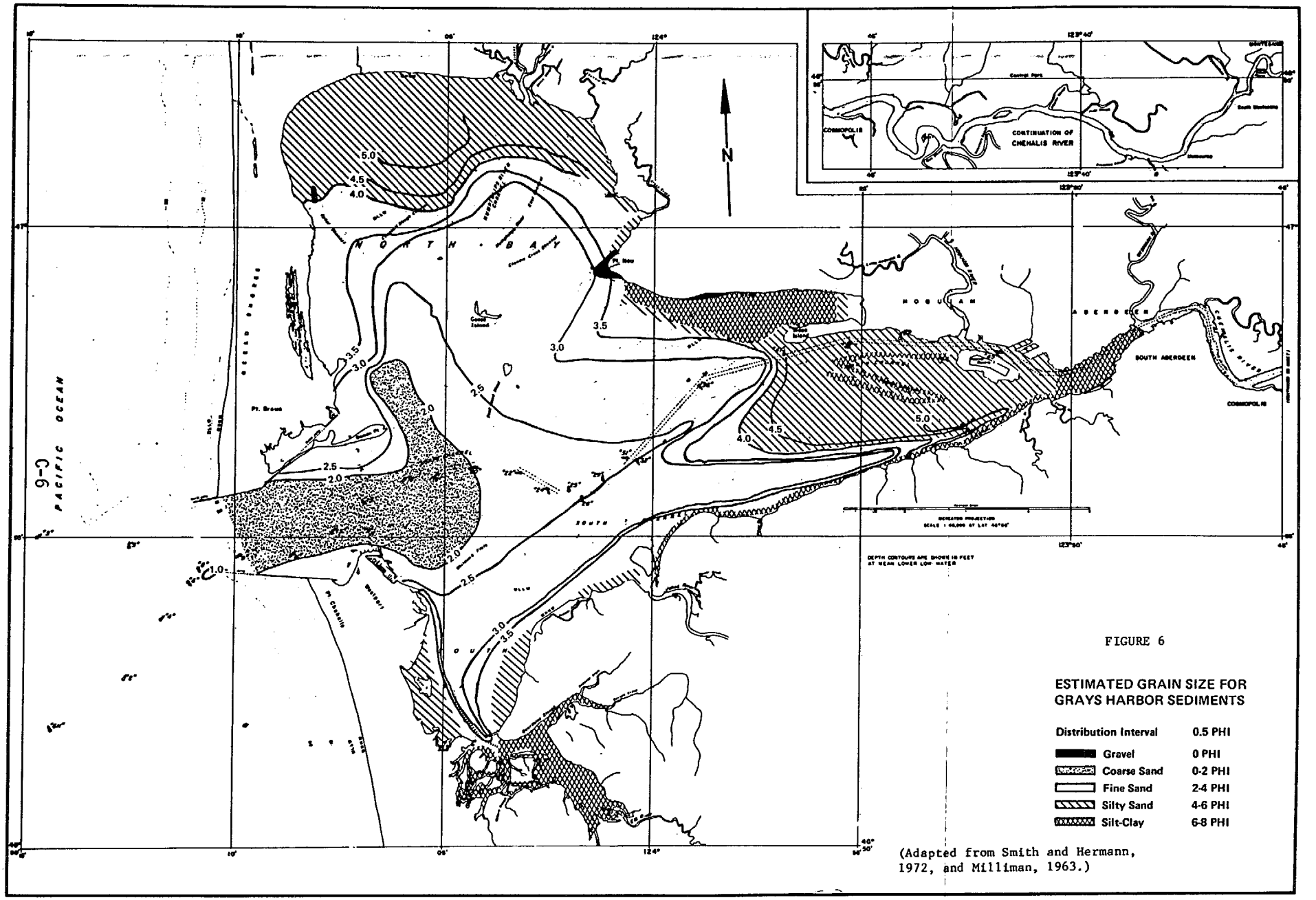
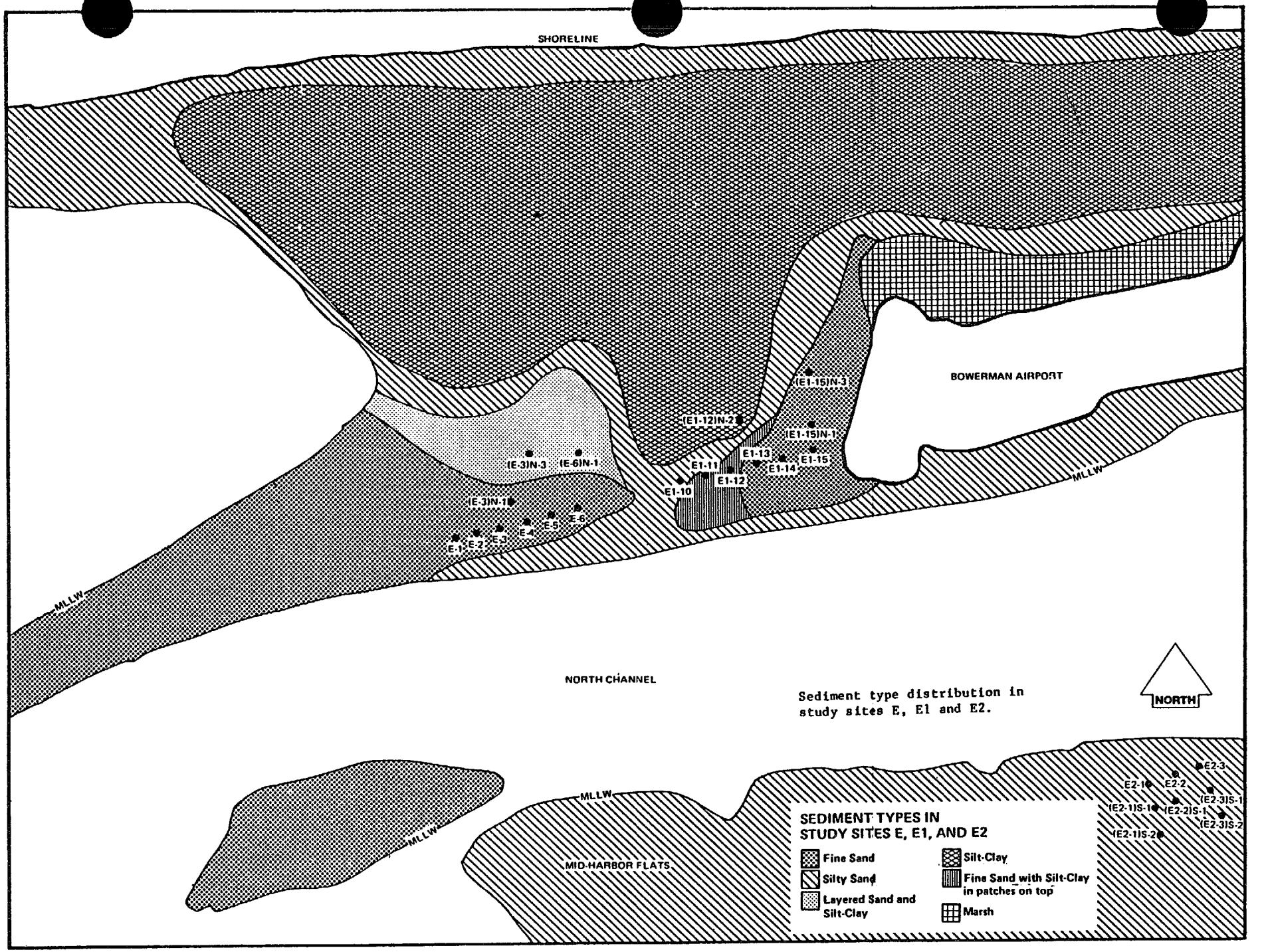

PACIFIC OCEAN
NORTH BAY
HOQUIAM
ABERDEEN
SOUTH ABERDEEN
COSMOPOLIS
CONTINUATION OF CHEHALIS RIVER
N
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.0
DEPTH CONTOURS ARE SHOWN IN FEET AT MEAN LOWER LOW WATER
FIGURE 6
ESTIMATED GRAIN SIZE FOR GRAYS HARBOR SEDIMENTS
Distribution Interval 0.5 PHI
Gravel 0 PHI
Coarse Sand 0-2 PHI
Fine Sand 2-4 PHI
Silty Sand 4-6 PHI
Silt-Clay 6-8 PHI
(Adapted from Smith and Hermann, 1972, and Milliman, 1963.)

FIGURE C-2



Sediment type distribution in study sites E, E1 and E2.

FIGURE C-3

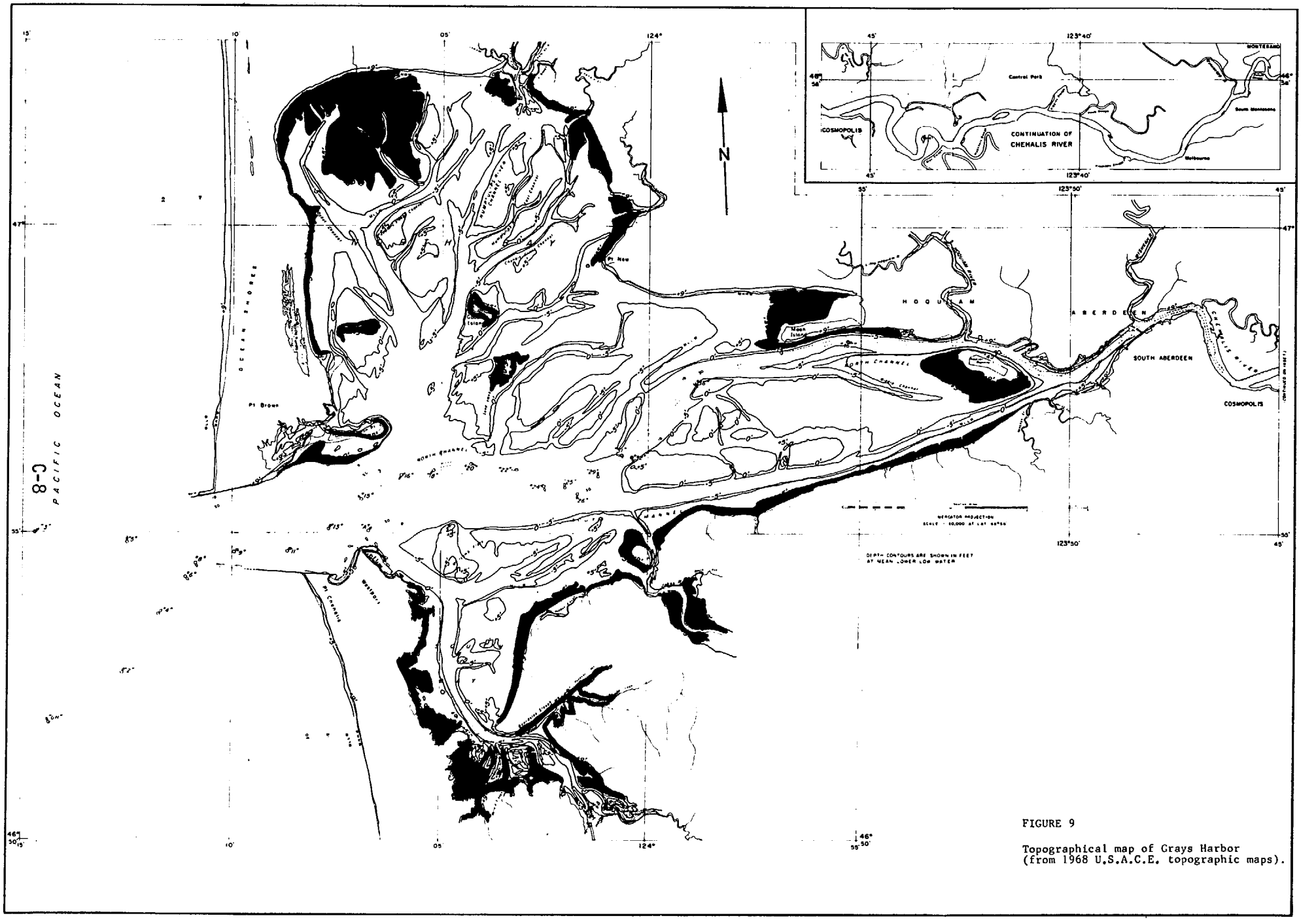


FIGURE 9

Topographical map of Grays Harbor
(from 1968 U.S.A.C.E. topographic maps).

FIGURE C-4

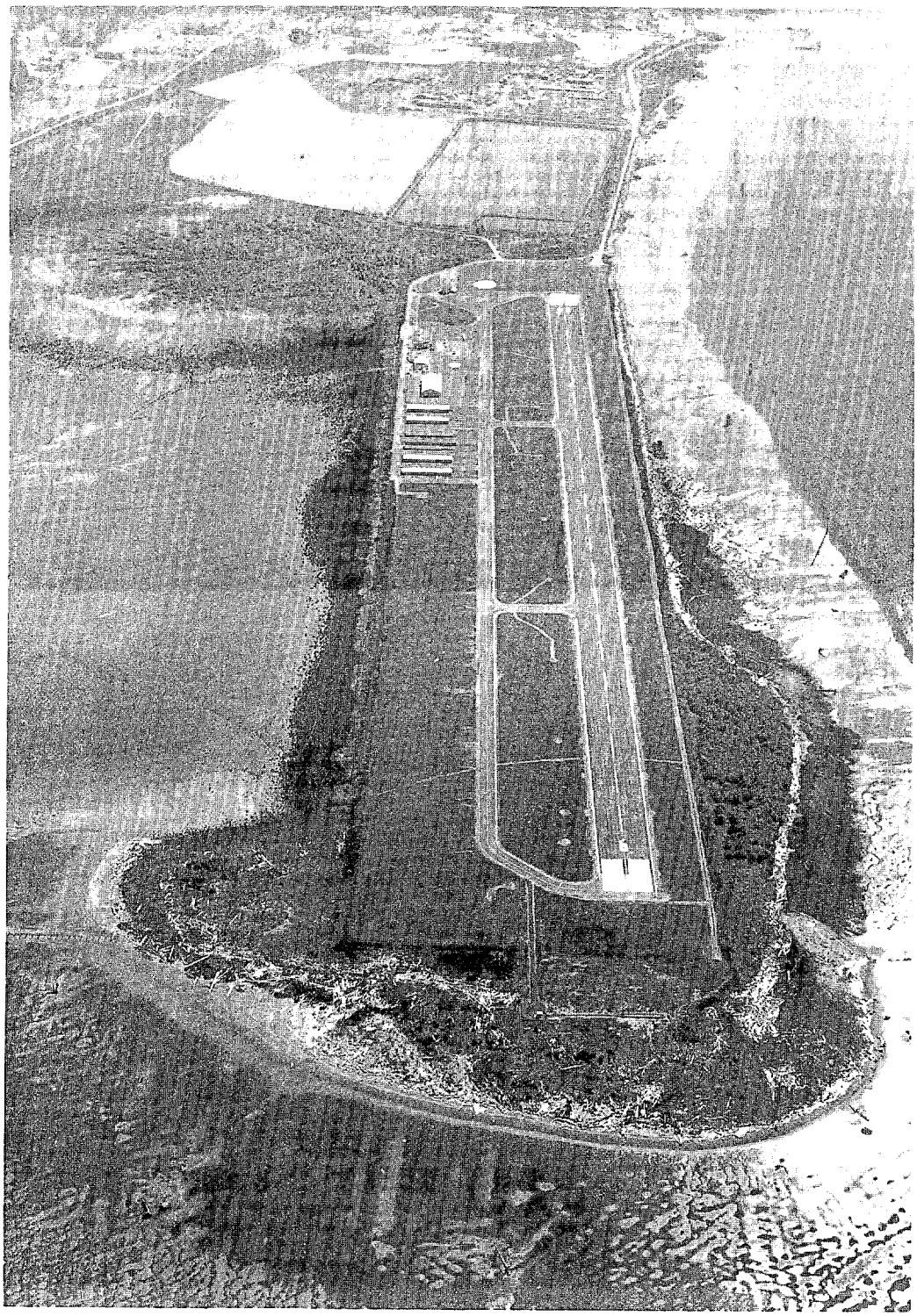
sedges (Carex sp.), American searocket (Cakile edentula), beach pea (Lathyrus japonicus), deervetch (Lotus corniculatus), and brass buttons (Cotula cornonopifolia). East and northeast of the Airport the tideflats are bordered by scattered stunted red alders (Alnus rubra) and willows (Salix sp.). In the southeast portion of the basin the elevation is slightly higher and a fairly diverse assemblage is found, including black willow (Salix lasiandra), Scouler's willow (S. scouleriana), red alder, the sedges (C. lyngbyei) and (C. obnupta), and the grasses red top (A. alba), Pacific silverweed (Potentilla pacifica), water parsley (Oenanthe sarmentosa), cattail (Typha latifolia), brass buttons, and seashore saltgrass (Distichlis spicata). These species are also found on the high elevations of the north border of the basin. Pickleweed (Salicornia virginica), saltmarsh sandspurry (Spergularia marina), and seaside arrow-grass (Triglochin maritimum) are the most abundant pioneer species. Other species found in higher elevations there include the grass Agrostis alba, western dock (Rumex occidentalis), orache (Atriplex patula), sedge (C. lyngbyei, meadow barley (Hordeum brachyantherum), and red canary grass (Phalaris arundinacea) (Herman 1978).

b. The salt marsh along the eastern border of the Basin forms a horseshoe shaped projection into the tideflats (sometimes referred to as the "fan" - see photo C-3). Seaside dock (Rumex maritimus), weeping alkaligrass (Puccinella distans), American bulrush (Scirpus americanus) are species found in areas influenced by freshwater. An algal community of Vancheria sp. and Oscillatoria sp. is found on the tidal substrate not covered by vascular halophytes (Corps App. H, 1976). Shorebirds forage on the saltmarsh plants S. marina and T. maritimum when high tides prevent them from feeding on the tideflats. Much of the marsh habitat in the eastern part of the Basin has been established over the last 8-10 years since dredge disposal operations ceased.

c. The lowest tideflat portion of the Basin is sparsely vegetated with eelgrass (predominately Zostera marina) which is an important part of the diet of waterfowl. Denser beds of eelgrass can be found west of the Basin in the Moon Island Tideflats.

d. Although the saltmarsh and grass areas are important as wildlife habitat, they cover only one fifth of the area of the Basin; four fifths being occupied by intertidal mudflats. The remaining 1700 acres of MU 12 is also predominantly intertidal with some subtidal habitat near the western limits. These non-vegetated intertidal areas are highly productive areas. The ability of mudflats to drain slowly is a contributing factor to their high productivity since it leaves them exposed to environmental extremes for a shorter period of time than are areas which drain quickly. The direct contact between the sediments, water, atmosphere and biota in non-vegetated wetlands facilitates nutrient cycling and storage (the sediments act as both a nutrient source and sink, regulating the productivity and keeping it at a constant level). The shallow depths of intertidal areas expose them to relatively large amounts of light the year round and favor respiration of the algae and phytoplankton, and the regeneration of nutrients by the formation of algal mats (Theberge, et.al. 1978).

(1). Exposed mudflats support a large macrobenthic population. The benthic organisms found in these finer grained sediments tend to be small, thin shelled, and are usually confined to the upper five centimeters of the sediment (the oxidized layer). The density of invertebrates on mudflats is



Photograph C-3. Bowerman Peninsula and the "Fan."

extremely high, and in the high intertidal is greater than at comparable elevations on any other substrate. This density is of tremendous importance to vertebrates, especially shorebirds, which feed on these invertebrates. High intertidal areas are exposed a large percentage of the time by low tides, greatly increasing the amount of time available for shorebirds to feed in comparison to mid- and lower intertidal zones. This is especially critical during winter when mean tidal levels are often increased by storms and high freshwater runoff. During these periods, the availability of feeding area is a critical factor for shorebirds. The birds become heavily dependent on these high elevation mudflats since they offer the greatest food resources. Mudflats are, therefore, extremely important in supporting shorebirds and shorebird predators such as falcons, especially during winter (Albright, et.al. 1980) Figure C-5 shows how various shorebirds may be distributed on mudflats based on vertical feeding ranges. Other substrates such as sand flats, coble and rock are also utilized by different types of shorebirds in the estuary (Herman & Bulger 1981).

(2). The Bowerman Basin contains approximately 450 acres of intertidal mudflats of the approximately 34,000 acres of intertidal lands remaining in the estuary.

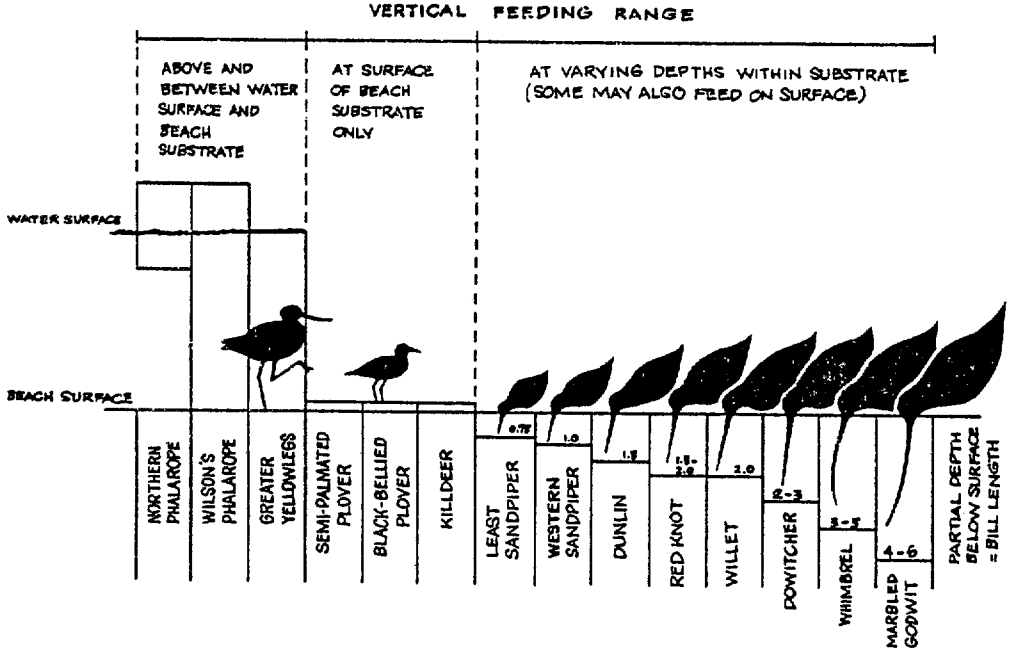
3. Fauna

a. Benthic Invertebrates. Several studies have been conducted on the abundance, distribution and importance of the benthic invertebrates in Grays Harbor. The studies have shown that the crustacean amphipod, Corophium sp. and Anisogrammarus confervicolus are two of the most abundant and important species to serve as a prey base for numerous other organisms. There are several different species of Corophium including C. salmonis and C. spinicorne which are known to be abundant in Grays Harbor. C. salmonis is a dominant member of the mudflat community and C. spinicorne is abundant in the Chehalis River section near Cosmopolis. C. salmonis is extremely important to shorebirds in portions of Grays Harbor and C.spinicorne appears to be important to the fishery resources along the fish passage (Albright & Armstrong 1982). The major focus for MU 12 therefore is turned to C. salmonis.

(1). C. salmonis distribution and abundance appears to be determined largely by sediment type and beach slope. Silty-sand or silt-clay substrates present on broad, gently sloping tideflats appear to support the highest densities (see figures C-2 and C-3). Salinity does not appear to be as important a factor in controlling C. salmonis distribution and abundance as sediment type. Elevation is also an important factor in determining distribution and abundance (Albright & Armstrong 1982). This does not necessarily mean that the Bowerman Basin has the highest abundance of Corophium sp. in the estuary. Samples however, may be naturally depressed due to heavy shorebird predation. There are other sites which have been identified as having higher densities and which are not utilized to the same extent as the Bowerman Basin. Table C-1 for example, shows that the mid-harbor tideflats have prodigious densities (32 - 56,000/sq. meter) of Corophium in muddy sand sediments but existing literature doesn't identify the flats as being important to shorebirds. Table C-1 also shows that the eastern end of Bowerman Basin at the higher elevations does not appear to support large densities of C. salmonis (3,300 - 5,800/sq. meter) above the 2.1 meter (approximately +7 feet) elevation above MLLW.

FIGURE C-5

FEEDING DISTRIBUTION ON MUDFLATS AND NEWSHORE WATERS BY SELECTED SHOREBIRDS.



Shorebirds are able to probe below the surface to varying depths according to bill length (the numbers indicate both length of bill and depth to which they can probe in inches). They also have varying leg lengths, and are able to wade in shallow water, as illustrated by the Greater Yellowlegs which feeds in tidalpools and shallow nearshore waters. Phalaropes generally feed while resting on the water's surface, while Plovers feed on organisms on the surface of beach substrates.

Source: Albright, Rick, et. al., Coastal Zone Atlas of Washington, Land Cover/Land Use Narratives, Vol. II, Washington Department of Ecology, June 1980

TABLE C-1

Table 13: Densities of C. salmonis in Grays Harbor, Washington. Data for all locations except Sites M and MC taken from Albright and Rammer, 1976.

Location	Date	Elevation	Mean No. per m^2	Max. no. per m^2	Sediment
Mid-harbor flats	3-75	.9-1.2 m	36,700	50,000	Muddy sand
Mid-harbor flats	8-75	.9-1.2 m	32,300	56,000	Muddy sand
W. of Moon Island	10-74, 4-75, 7-75	1.8 m	4,900	6,800	Muddy sand
W. of Moon Island	10-74, 5-75, 7-75	1.8 m	7,700	14,600	Fine sand
W. of Moon Island	10-74, 4-75, 7-75	1.6 m	3,300	7,600	Fine sand
W. of Moon Island	10-74, 4-75, 7-75	2.1 m	3,700	6,200	Fine sand
W. of Moon Island	12-74, 5-75, 7-75	1.6 m	17,000	32,800	Mud
W. of Moon Island	12-74, 5-75, 7-75	2.2 m	3,000	5,900	Fine sand
E. end of Bowerman Basin	11-74, 7-75	~2.1 m	3,300	5,800	Mud
Mouth of O'leary Creek	9-74	~1.8 m	35,900	35,900	Mud
Mouth of Grass Creek	9-74, 10-74, 11-74	~2.2 m	200	300	Muddy sand
South Channel w. of Charlie Creek	11-74	~1.8 m	57,900	57,900	Mud
Site M	3-80 to 9-80	.6 m	6,600	18,300	Mud
		1.8 m	11,400	49,700	Mud
Site MC	3-80 to 9-80	1.8 m	13,300	42,400	Mud

Source: Albright and Armstrong, 1982

(2). Both abundance and diversity are important to shorebirds feeding in different substrates. Most shorebirds eat a variety of food and are opportunistic feeders. One study of the eating habits of dunlin in Grays Harbor identified from esophagi analysis the following types of food sources: 28.1% were annelid worms, 0.9% nematode worms, 37.3% arthropods, and 33.6% salt marsh plants. The amphipods Corophium and Anisogammarus confervicolous comprised 31.7% of the total (Corps, App. J, 1976). Other studies have shown higher concentrations of amphidpods or polychaete worms depending on location and substrate, and insects and seeds after high tide. Dunlin and western sandpipers are capable of eating different species of invertebrates in different estuaries as well. For instance, in the Copper-Bering River Deltas system in Alaska, dunlins feed primarily on bivalve molluscs, particularly Macoma balthica, while western sandpipers have a very diverse diet including molluscs, amphipods, and insect larvae (Senner 1977). A distinct Corophium-dunlin relationship in the inner harbor and Bowerman Basin, however has been previously documented. The highest densities of Corophium ssp. occur during the summer months after eggs have hatched (Albright, 1982), but as previously mentioned (p. II-22) intertidal invertebrate biomass is highest in the spring and lowest in summer.

b. Avian Fauna

(1). Species Utilization. During the 1981 spring migration period (April-May) at Grays Harbor, Dr. Steven G. Herman and John B. Bulger conducted one of the most complete and intensive studies on the distribution and abundance of shorebirds in Grays Harbor to date (Herman & Bulger 1981). The study documents the large number of shorebirds which utilize the estuary and that shorebird utilization was significantly higher than had been previously reported by other investigators. Table C-2 identifies the numbers of each species of shorebirds counted at eleven census sites around the harbor. Western sandpipers are by far the most numerous species of shorebirds present in the harbor during spring migration. Dunlin are the second most numerous species followed by dowitchers spp. Figure C-6 shows the timing and magnitude of the shorebird migration with peak numbers occuring between April 17 through April 28, 1981. The figure shows that the total number of shorebirds on April 23, 1981 amounted to nearly 1,000,000 birds. Table C-3 shows the average number of shorebird species recorded and indicates that Wakina Flat in the North Bay had the largest mean number of species (diversity) per day followed closely by the Bowerman Basin and Bottle Beach in South Bay. Wakina Flat was the most important site for black-bellied plovers, whimbrels and marbled godwits based on the mean numbers of birds during the migration period; Bowerman Basin for semi-palmated plovers, dunlins and western sandpipers; Point New for ruddy turnstones; Bottle Beach for red knots; Kurtz Slough and Bowerman Basin for dowitchers; and, Chenois Creek and Wakina Flat for greater yellowlegs. On the basis of the data, they conclude that Bowerman Basin supported 40% of the total shorebird numbers during the peak of migration, North Bay supported 30%, South Bay 25% and the Inner Harbor 5%. The results of the survey indicates that:

(a). Grays Harbor Estuary is host to more shorebirds than any other estuary along the Pacific Coast south of Alaska;

(b). Grays Harbor is of extraordinary and critical importance to spring-migrating shorebirds on the Pacific Coast;

Table C-2

Numbers of each species of shorebirds counted at all census sites in Grays Harbor during spring migration, 1981.

Species	April 25	27	28	29	30	May 1	2	4	5	6	7	9 & 10	13 & 14	$\bar{X}$
Semi. Plov.	830	630	400	430	800	650	680	450	360	350	380	490	160	510
Killdeer	P*	P	P	P	P	P	P	P	P	P	P	P	P	-
Golden Plov.				1				1			1			0.2
B-b. Plover	370	400	380	30	270	380	350	200	140	210	160	230	380	290
Surfbird												2		0.2
R. Turnstone	10	3	22	17	76	73	210	120	89	380	470	530	280	180
B. Turnstone	1		3		15	6	3	1			2			2
Snipe		2	2	2	1	2		2						1
Curlew	2								1	1				0.3
Whimbrel	7		1	3	5	18	19	15	38	18	33	38	64	20
Spotted Sand.												2		0.2
Willet	1							1						0.2
G. Yellowlegs	96	66	39	45	52	60	45	35	30	26	43	34	38	47
L. Yellowlegs	4		1	4	4	2	6				3	2		2
Red Knot	5,300	6,100	5,100	4,200	3,700	5,700	5,300	3,000	1,800	4,700	3,500	1,300	1,700	3,900
Rock Sandpiper					1									-
L. Sandpiper	P	P	P	P	P	P	P	P	P	P	P	P	P	-
Dunlin	28,000	31,000	8,300	8,200	8,400	10,000	12,000	7,000	5,000	11,000	16,000	5,800	3,600	12,000
W. Sandpiper	520,000	450,000	82,000	110,000	62,000	63,000	47,000	58,000	58,000	41,000	52,000	38,000	9,500	120,000
Dowitcher spp.	**30,000	34,000	7,000	15,000	4,000	7,500	6,000	4,500	2,700	2,100	2,200	1,300	390	9,200
H. Godwit	22	26	94	22	13	16	24	9	9	7	17	8	5	21
Sanderling	1	1				4	1				5	4	77	7
N. Phalarope								1					24	8
Totals	590,000	530,000	100,000	140,000	80,000	89,000	72,000	73,000	68,000	60,000	75,000	48,000	16,000	150,000

*species present but not counted
**both Long-billed and Short-billed Dowitchers present.

Source: Herman & Bulger (1981)

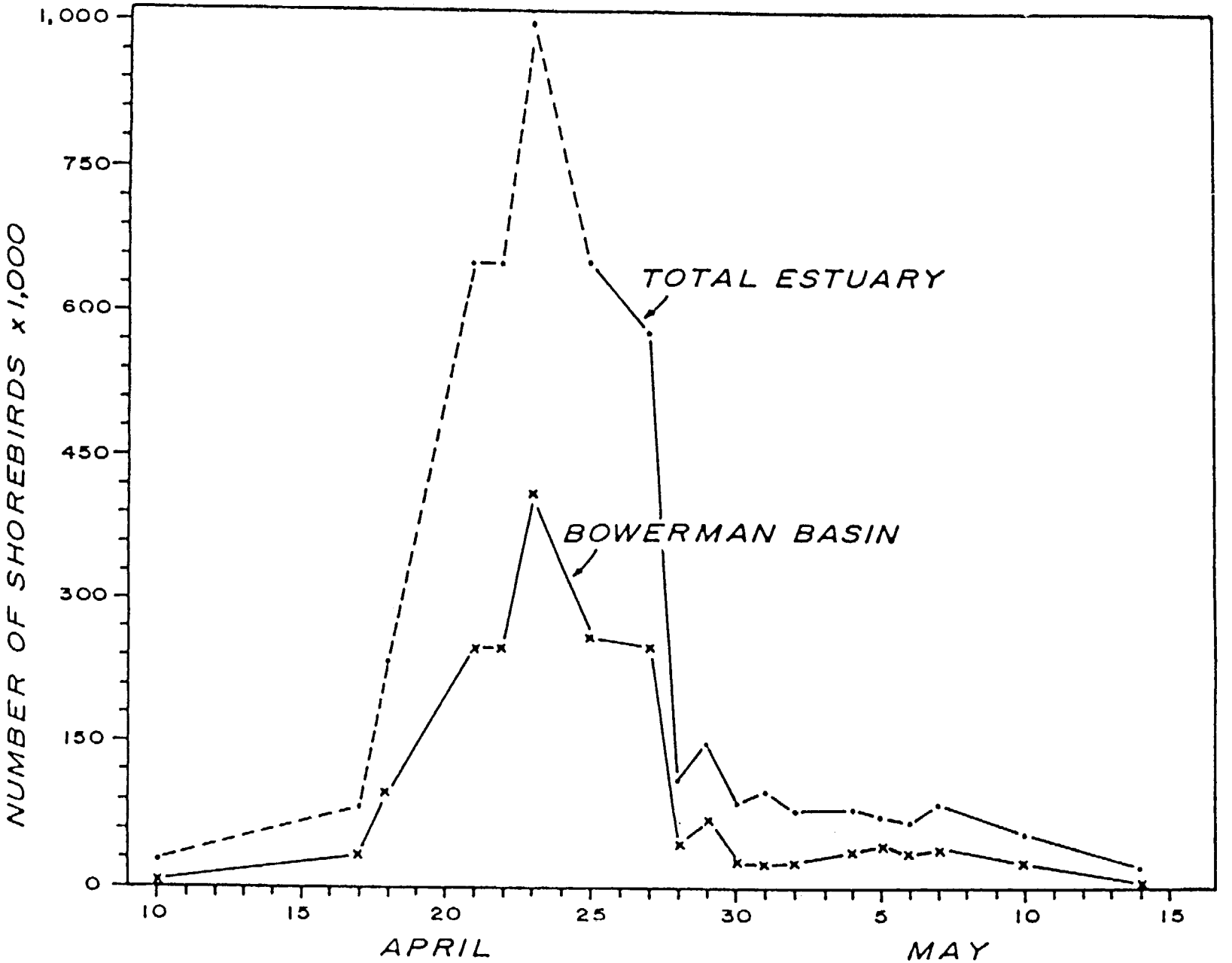


FIGURE C-6

Timing and magnitude of the shorebird migration at Grays Harbor, Washington, spring 1981. Dashed line represents extrapolation. (From Herman & Bulger, 1981)

TABLE C-3

Average number of shorebird species recorded each day at each census site during the period 25 April - 14 May.

Site	$\bar{X}$ number of species per day	Range	Area
Wakina Flat	11.5	8-14	North Bay
Bowerman Basin	9.8	8-13	Bowerman Basin
Bottle Beach	9.8	9-11	South Bay
Bay City	9.0	7-10	South Bay
Point New	8.8	8-12	South Bay
N. Wakina	8.8	8-11	North Bay
Chenois Creek	8.2	6-10	North Bay
Westport Flat	7.9	6-10	South Bay
Kurtz Slough	7.2	5-10	North Bay
O'Leary Creek	5.1	4-7	Inner Harbor
Newskah Creek	3.8	2-7	Inner Harbor

Source: Herman and Bulger, 1981

(c). All intertidal areas in the estuary, as well as many of the other wetlands and some upland sites, are important to migrants;

(d). The Bowerman Basin supported the largest numbers of shorebirds on every census day and is the most important site to migrating shorebirds in Grays Harbor for the following reasons:

o Bowerman Basin is the last area to cover on the incoming tide and the first to uncover, thereby providing the longest feeding time with food being abundant; (see photo C-4)

o It is one of the largest expanses of high mud in the harbor, and it is somewhat protected from wave action and other effects of weather;

o It offers a mosaic of habitats, including roosting areas of several kinds and good cover; (see photo C-5)

o The previous filling of areas to the east may have increased the density of birds using the Basin. (see photo C-6)

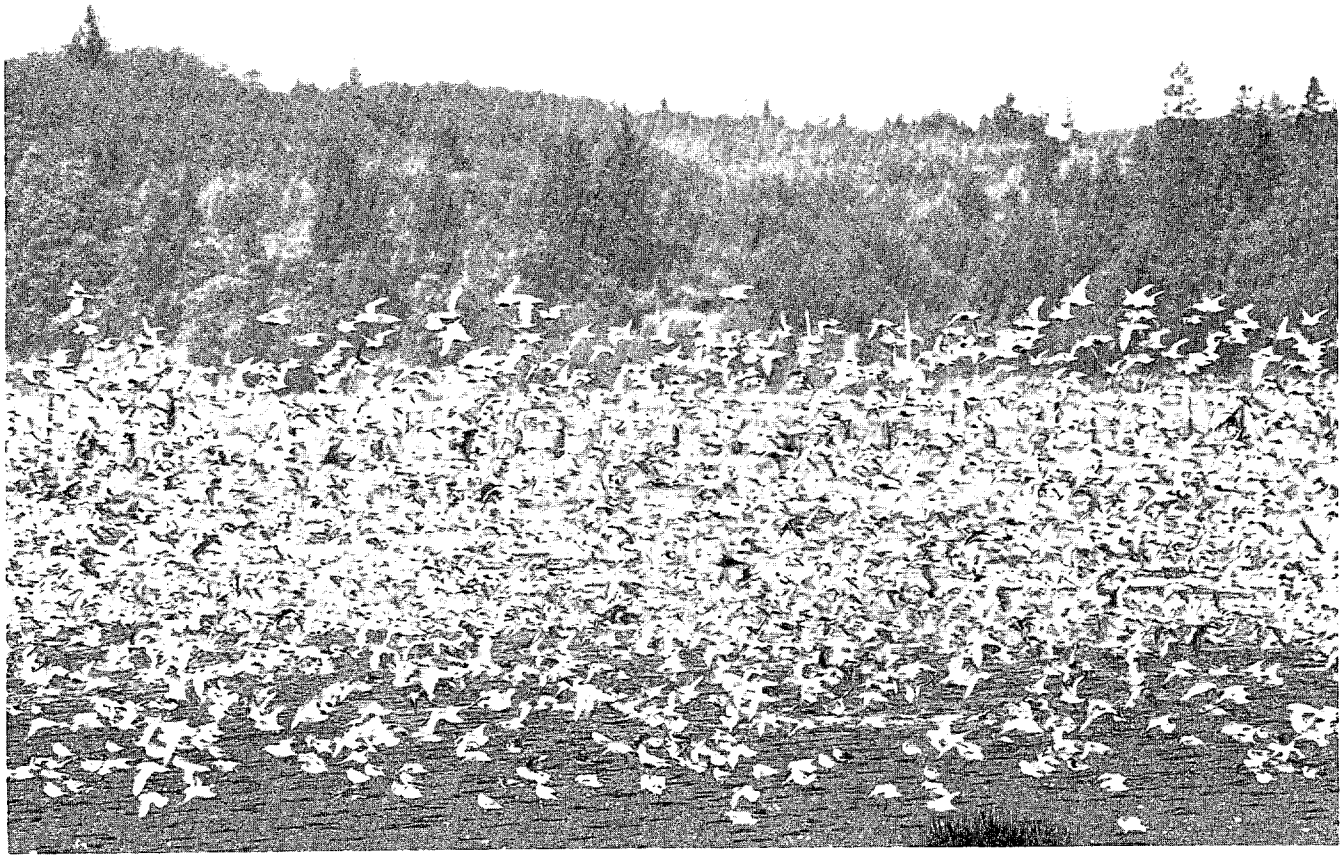
(2). Bowerman Basin is most significant as an area utilized extensively by foraging birds. Although several species forage in this intertidal area, its importance lies in the large number or densities of birds rather than the diversity of birds that utilize it (Paulson 1980). Shorebirds, waterfowl and terrestrial birds are all present in the Basin. Table C-5 contains a list of birds sighted in the Bowerman Basin by Dr. Dennis R. Paulson, Affiliate Curator of Birds at the Burke-Museum in Seattle, Washington. Both Dr. Paulson and Dr. Herman have identified the Bowerman Basin as the most significant bird habitat site within MU 12 as well as studies conducted by the Washington State Department of Game for the Corps of Engineers. This includes the easterly portion of Area 1 and Area 3. Area 2 is also used for feeding and roosting and Area 4 (Mini-Moon Island) is used primarily for roosting. Area 2 is not as significant a site as the Bowerman Basin. Figure C-7 shows the differences in densities of the areas west of the peninsula (Site E) and north of the peninsula (Site E-1).

(3). Dunlin (Calidris alpina)

(a). The tideflats in Bowerman Basin are one of the largest wintering grounds for the shorebird dunlin on the west coast. Dunlin concentrations reached 3,500 birds per 100 acres in 1975, and 10,000 to 50,000 individuals regularly use the area (Corps, App. H, 1976) Dunlin use Grays Harbor from October to April and then migrate to Alaskan breeding grounds. Dr. Dennis R. Paulson identified 3 migratory peaks of shorebirds by conducting weekly censuses of the area during the fall of 1979. The first is late June/ early July with the returning of adult western sandpipers, short-billed dowitchers and whimbrels; the second in mid-August to early September with the peaking of juveniles of these and other species; and the third at the end of October as large numbers of dunlin arrive (Paulson, per. comm., 1983). Dunlin utilize many areas of the harbor. During the spring migration, highest concentrations of dunlin for a short duration of time were found in South Bay (April 25 & 27 19,000 and 16,000 respectively) and the largest mean population was distributed in North Bay (North Bay 4,100, South Bay 3,500 and Bowerman Basin 3,400) (Herman & Bulger 1981). The dunlin is a migrant and quite common and locally abundant winter resident in many other parts of Washington. "A Baseline Survey of Significant Marine Birds in Washington State," identifies other major and

Photograph C-4. Bowerman Basin: Birds Roosting. Source: S.G. Herman 1980

Photograph C-5. Bowerman Basin: Birds Feeding & Roosting. Source: Herman 1980



Photograph C-6. Bowerman Basin: Birds in Flight. Source: S.G. Herman 1980

minor sites in which wintering flocks of dunlin have been identified. The maps are reproduced in the following pages to give the reader an idea of the extent of dunlin distribution within Washington State. In most cases, equivalent studies as those conducted by Herman and Bulger have not been done for other areas in Washington. One example might be given of the number of dunlin present on a different substrate (sand) at Dungeness Spit, Washington. Table C-6 shows the number of shorebirds observed by Mr. Karl Gruebel on Dungeness Spit. Dunlin were abundant and numbered in the 1000's during the winter months (Albright, et.al. 1980)

(b). Dunlin have historically been present in Grays Harbor. The following excerpt from the Birds of Washington State dates back to 1920.

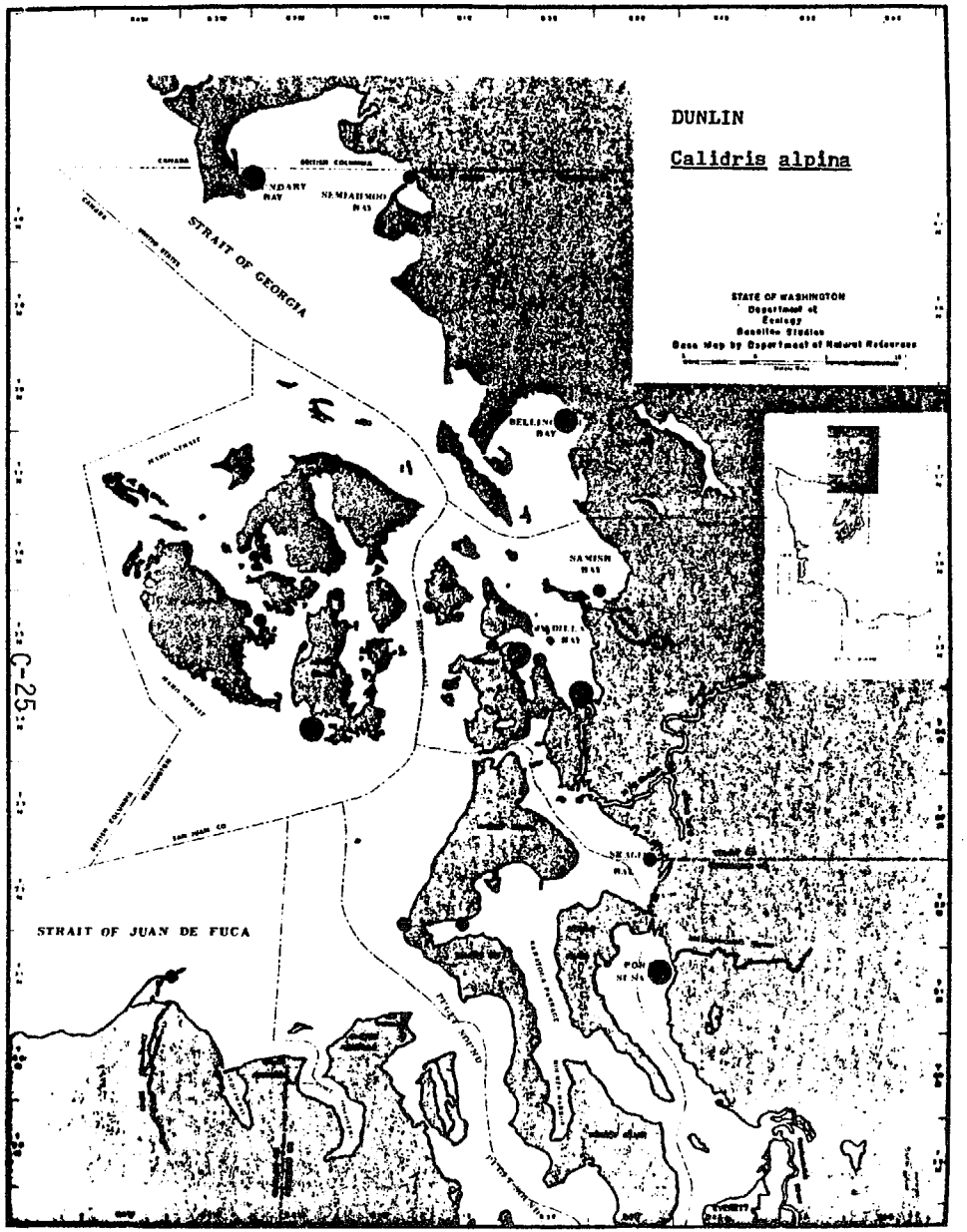
> When crossing Grays Harbor on April 6, 1920, just as the ebbing tide was beginning to expose the mud flats, Cantwell saw several small flocks of dunlins passing overhead, some settling on boom logs at short range, permitting certain identification. A thousand or more thus flew by, coming from the sand beach on the lee side of the harbor about Westport. Suddenly an immense flock appeared, looking like a waving dark ribbon in the sky. The flock was estimated to be fully a mile long, and about 50 feet wide, and containing 10,000 birds, the largest flock of sandpipers seen in many years' experience. As Hoquiam and Aberdeen were neared, this immense flock was found scattered out over the mud flats.

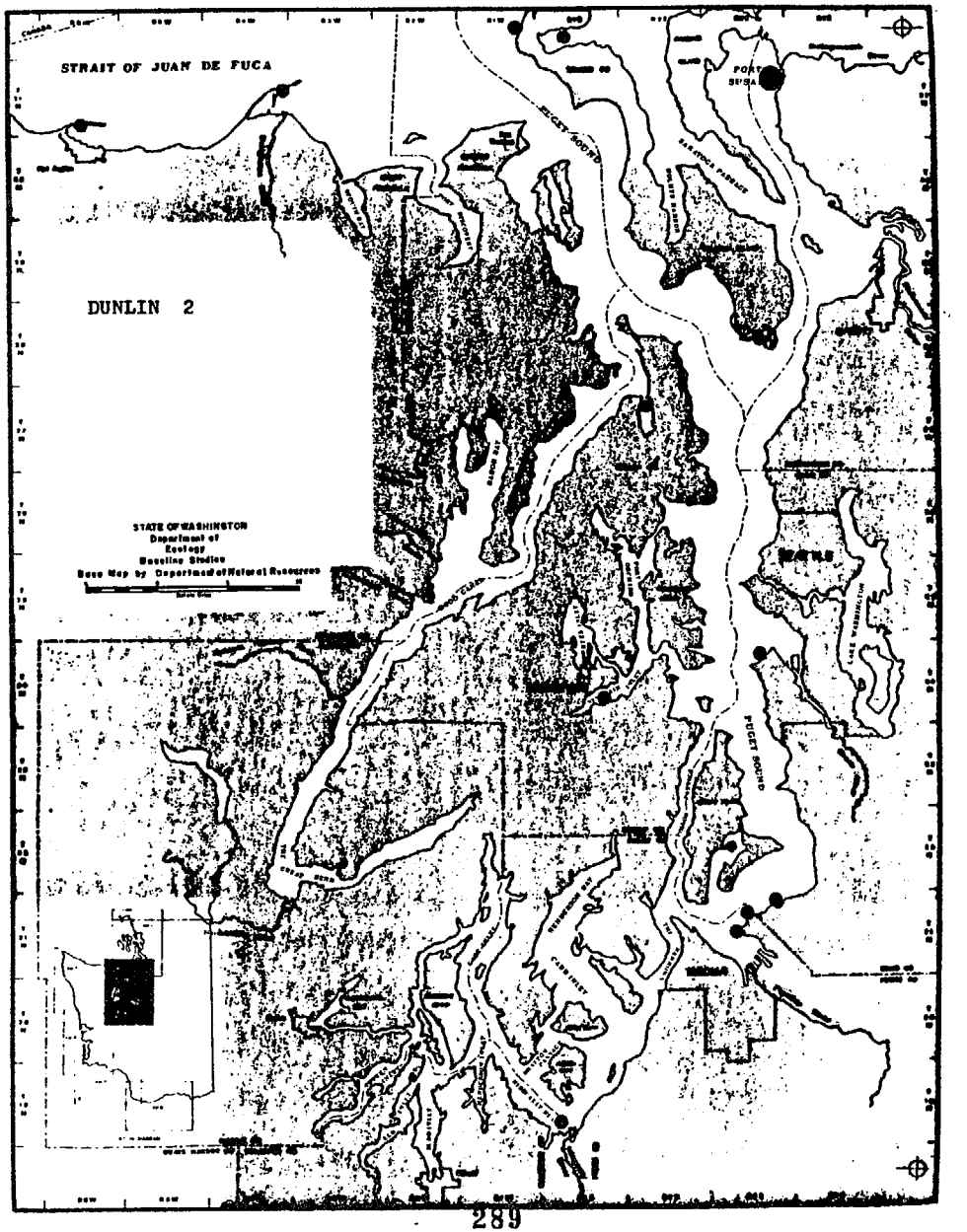
From this, one may interpret that the Bowerman Basin and areas eastward which are now filled have historically been used by dunlin. Figure C-8 shows the extent of tidelands in the Bowerman area prior to 1940.

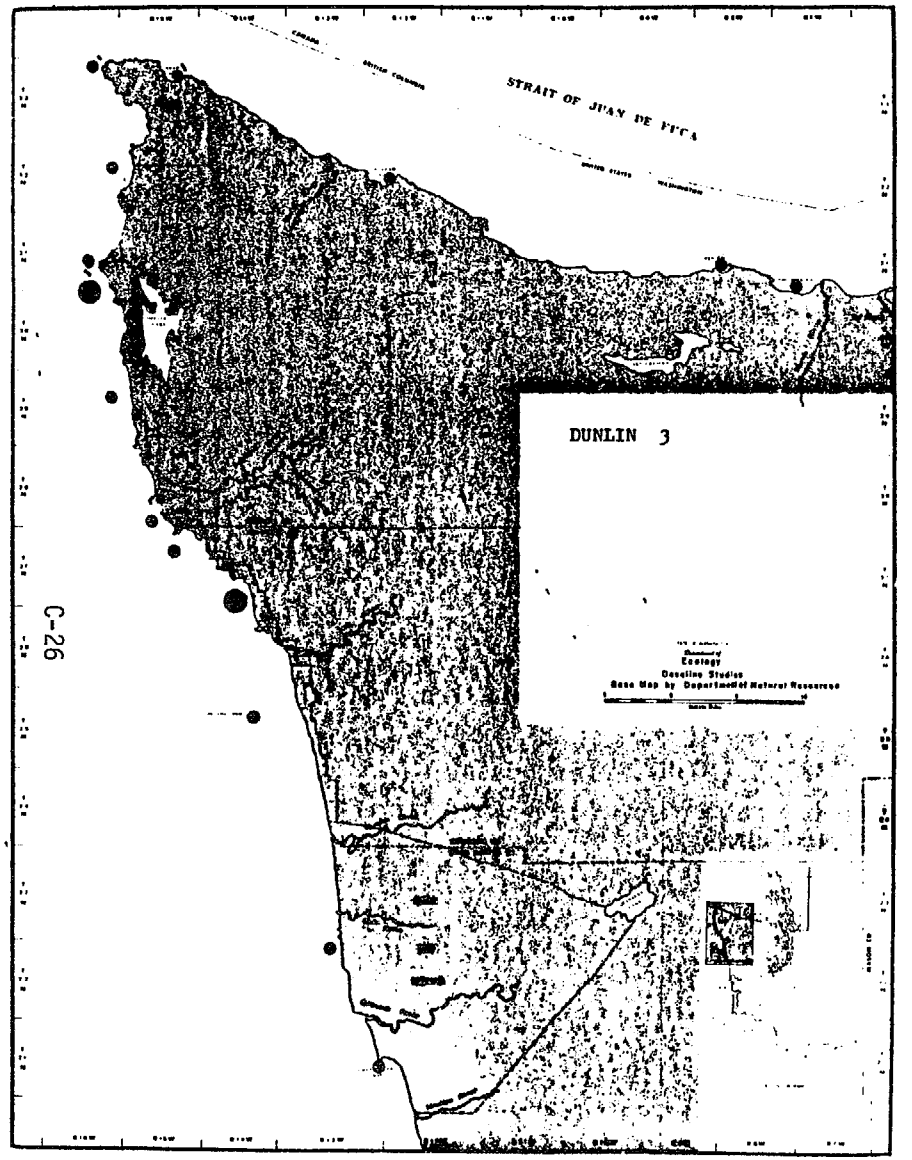
(4). Western Sandpipers (Calidris mauri)

(a). Western sandpipers are among the most abundant shorebirds in the world. Isleib (1979) estimates that the south-central coast of Alaska is host to more than 20 million shorebirds each spring, the bulk of them being western sandpipers (6 1/2 million) and dunlins (3 1/2 million). Herman and Bulger (1981) report that western sandpipers were the most abundant migrant shorebird species in Grays Harbor and Bowerman Basin was the site most utilized each day during the 1981 spring migration with as many as 400,000 birds feeding in the Basin on 23 April 1981. Bowerman Basin contains less than one square mile of tidal mudflats. A density of 410,000 birds may represent the largest concentration per square mile ever recorded. Isleib (1979) has reported densities up to 250,000 shorebirds per square mile in the Copper River Delta in Alaska during spring migrations. Herman and Bulger's census figures show the Basin's significance during the peak migration period in particular. Figure C-7 shows the distribution of western sandpipers in Grays Harbor from 25 April - 14 May 1981. Herman and Bulger (1981) report that concentrations of 500,000 to nearly 1,000,000 western sandpipers were present from 20-27 April 1981, accounting for 85 to 90 percent of all shorebirds present and that they were widely dispersed throughout Grays Harbor.

(b). The prime breeding range of western sandpipers are the Yukon-Kuskokwim Delta and the Seward Peninsula in western Alaska (Senner, 1979). During investigations conducted in Alaska, Senner (1979) has found evidence that the Copper-Bering River Deltas serve as critical habitat in the annual cycle


DUNLIN
Calidris alpina
STATE OF WASHINGTON
Department of
Ecology
Baseline Studies
Base Map by Department of Natural Resources
STRAIT OF GEORGIA
STRAIT OF JUAN DE FUCA


STRAIT OF JUAN DE FUCA
DUNLIN 2
STATE OF WASHINGTON
Department of
Ecology
Baseline Studies
Base Map by Department of Natural Resources
PUGET SOUND


STRAIT OF JUAN DE FUCA
DUNLIN 3
Ecology
Baseline Studies
Base Map by Department of Natural Resources

DUNLIN 4
GRAYS HARBOR
WILLAPA BAY
COLUMBIA RIVER
Ecology
Baseline Studies
Base Map by Department of Natural Resources

Table C-6

SHOREBIRDS OBSERVED ON DUNGENESS SPIT,
SEPTEMBER - NOVEMBER 1977 AND 1978

Species	High Daily Count
Black Oystercatcher	5
Semipalmated Plover	50
Killdeer	23
Black-bellied Plover	100's
Ruddy Turnstone	15
Black Turnstone	38
Whimbrel	6
Greater Yellowlegs	4
Wandering Tattler	9
Willet	1
Surfbird	8
Red Knot	5
Sanderling	100's
Semipalmated Sandpiper	2
Western Sandpiper	100's
Least Sandpiper	17
Dunlin	1000's
Short-billed Dowitcher	100's
Marbled Godwit	2
Northern Phalarope	6

Source: Albright, et.al. 1980

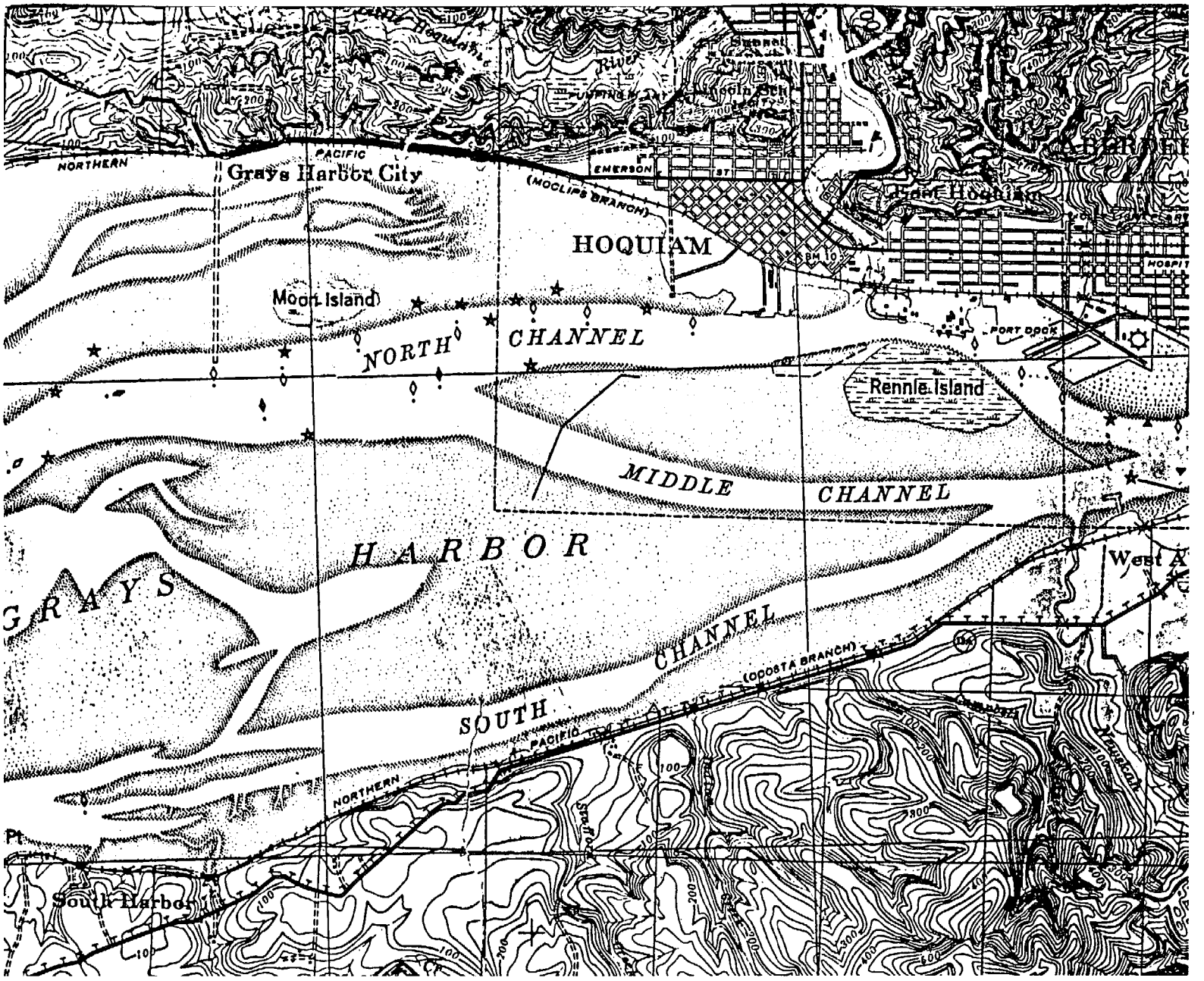


FIGURE C-8.
Bowerman Basin circa 1940.

of western sandpipers and dunlins. The deltas serve as a critical stopover where the birds replenish fat reserves and rest prior to flying to their breeding grounds in western Alaska, a distance of 1,000 kilometers. Drs. Herman and Paulson believe that the species which utilize Grays Harbor as a "staging area" during spring migration may fly directly to the Copper-Bering River Delta system, a distance of 1,000 miles (1,600 kilometers) or more and therefore need to replenish fat reserves to propel them for this long-distance flight. If Grays Harbor is the last "staging area" prior to departing for the long flight, then this leads credence to the importance of the Grays Harbor estuary as also providing critical habitat to the shorebirds.

C. POTENTIAL IMPACTS TO AVIAN FAUNA

1. U.S. Fish & Wildlife Service (F&WS) Opinion

a. The Washington Area Office of the F&WS has provided OCRM with two separate assessments on the GHEMP. The first assessment (dtd March 31, 1981) addressed impacts associated with implmentation of an earlier version of GHEMP which would have allowed filling of the Bowerman Basin while protecting the area west of the peninsula and Basin beyond the trestle line. Their assessment concluded that the Bowerman Basin was important to the integral well-being of the American peregrine falcon (Falco peregrinus anatum) vis-a-vis the shorebird utilization of the Basin. Consequently, filling all 500 acres of the Basin would likely jeopardize the continued existence of the peregrine falcons which hunt in the Basin and require large concentrations for their hunting success.

b. In response to their opinion, a mini-Task Force was formed to consider alternatives to the configuration for development and came up with a totally new development scenario based upon the importance of resources in the Bowerman Basin to shorebirds and falcons and is described in GHEMP, pp. 60-69. The F&WS reviewed the new proposal which would extend the peninsula westward, thereby avoiding what has been identified as the most critical habitat and conditionally permit some development (airport relocation) northward subject to stringent requirements. After OCRM reinitiated formal Section 7 consultation, the F&WS rendered a new opinion (dtd December 11, 1981) based upon the revised GHEMP. Because of their importance, both letters are incorporated in their entirety into the PDEIS and serve as the major assessment of impacts to shorebirds, waterowl and endangered peregrine falcons (and in reality, all birds of prey). While the Section 7 opinion was concerned mainly with impacts to the falcons, it necessarily had to focus on impacts to the shorebirds (the falcons prey base). They concluded that the high densities of wintering and migratory shorebirds needed to sustain the falcons should not be reduced given certain mitigation measures. The December 11, 1981 opinion is however, a guarded assessment because of uncertainty associated with shorebird and peregrine falcon response to filling Area 2. Referring to Area 3 which may fill as much as 73 acres of the Bowerman Basin, they state that "a quantifiable impact to peregrine falcons will not be known until after Area 2 is filled and an analysis of shorebird and peregrine falcon response is made," and also that "several data gaps concerning peregrine falcons at Grays Harbor exist."

THE FOLLOWING ARE BIOLOGICAL OPINIONS OF THE
U.S. FISH AND WILDLIFE SERVICE ON THE IMPACTS
ASSOCIATED WITH IMPLEMENTING THE
GRAYS HARBOR ESTUARY MANAGEMENT PLAN TO THE
AMERICAN PEREGRINE FALCON

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Area Office
2625 Parkmont Lane
Olympia, Washington 98502

March 13, 1981

Dr. Robert R. Kifer, Chief
NEPA Compliance Unit
Department of Commerce
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management
Washington, D. C. 20235

Dear Dr. Kifer:

This is the U.S. Fish and Wildlife Service's (FWS) reply to your November 24, 1980 request for formal consultation (#1-3-81-F-407). This Service requested an extension to the consultation period on February 13, 1981, in order to address the alternative plan documented in the addendum to your assessment dated January 6, 1981. Your agreement to extend the consultation period to March 15, 1981 was given in your letter of February 23, 1981. This consultation addresses the proposed Grays Harbor Estuary Management Plan (GHEMP), including the alternative plan, and its subsequent impacts to the bald eagle (Haliaeetus leucocephalus alascansus), listed as threatened in Washington; brown pelican (Pelicanus occidentalis californicus), listed as endangered in Washington; the peregrine falcon-subspecies American peregrine falcon (Falco peregrinus anatum) and Arctic peregrine falcon (Falco peregrinus tundrius)--which are Federally listed as endangered in Washington.

On March 10, 1981, we completed a review of the proposed GHEMP, the subsequent alternative, dated January 6, 1981, reports transmitted with your consultation request, and relevant literature. Several individuals with particular expertise and knowledge of peregrine falcons, shorebirds and Grays Harbor were contacted for additional information. Quantitative and qualitative site-specific information on shorebirds and peregrine falcons in Grays Harbor in general, and Bowerman Basin in particular, were supplied by Dennis Paulson, Washington State Museum, University of Washington, and Steve Herman and co-workers from The Evergreen State College. The following wildlife biologists from the Washington Department of Game were contacted: Eric Cummins, Fred Dobler and Jack Smith. Bob Gill (shorebird research program leader - Anchorage) and Dave Harlow (peregrine falcon recovery team) of the U.S. Fish and Wildlife Service were contacted as was Richard Olendorff (peregrine falcon recovery team) of the Bureau of Land Management. Additional information was supplied

by Clifford (Bud) Anderson, peregrine falcon researcher, Bellevue, Washington; Pete Conners, Bodega Bay Marine Lab, Bodega Bay, California and Lynne Stenzel, Point Reyes Bird Observatory, Stinson Beach, California.

Both aerial and ground field trips were conducted to gain a sense of topography and habitat types. Information was also gathered from an interagency public meeting held on December 8-10, 1980. The GHEMP proposal and a suggested development alternative were discussed at this meeting, as reflected in the addendum to the GHEMP biological assessment completed on January 6, 1981.

Biological Opinion

It is the Service's biological opinion that the implementation of the GHEMP as described in your biological assessment dated November 24, 1980 and the addendum dated January 6, 1981, which included the alternative plan, are not likely to jeopardize the continued existence of the bald eagle or brown pelican. Therefore, these two species will not be discussed in the remainder of this biological opinion. It is also our biological opinion that the development of Bowerman Basin (Unit 13), which is a part of the GHEMP, as presented in your November 24, 1980 assessment, is likely to jeopardize the continued existence of the peregrine falcon. As defined in the Service's Interagency Cooperation Regulations published in the Federal Register (FR 875; 1/4/78), the phrase "jeopardize the continued existence of "means to engage in an activity or program which reasonably would be expected to reduce the reproduction, numbers, or distribution of a listed species to such an extent as to appreciably reduce the likelihood of the survival and recovery of that species in the wild.

We cannot insure that the alternative development plan presented in your January 6, 1981 assessment will not jeopardize the continued existence of the peregrine falcon. Therefore, based on the best scientific information available, this Service is of the opinion that this action may jeopardize the continued existence of the peregrine falcon. We base this opinion on the fact that the alternative plan is conceptual and specific biological information associated with the impacts and the areas to be impacted is insufficient. Implementation of protective measures which are offered as reasonable and prudent alternatives in a latter section of this opinion could lead to a non-jeopardy opinion.

To aid in developing a perspective for our opinion, we have included an account of the proposal, as presented in OCZM's biological assessment, and a rationale of our opinion.

Project Description

Grays Harbor is one of the Pacific Coast's six major estuary systems and is located on the southern Washington coast (Fig. 1). The harbor lies wholly within Grays Harbor County. The major cities of Aberdeen and Hoquiam are situated in the estuary's upper reaches. Their economies depend in large part upon Grays Harbor as a resource for fishing, shipping

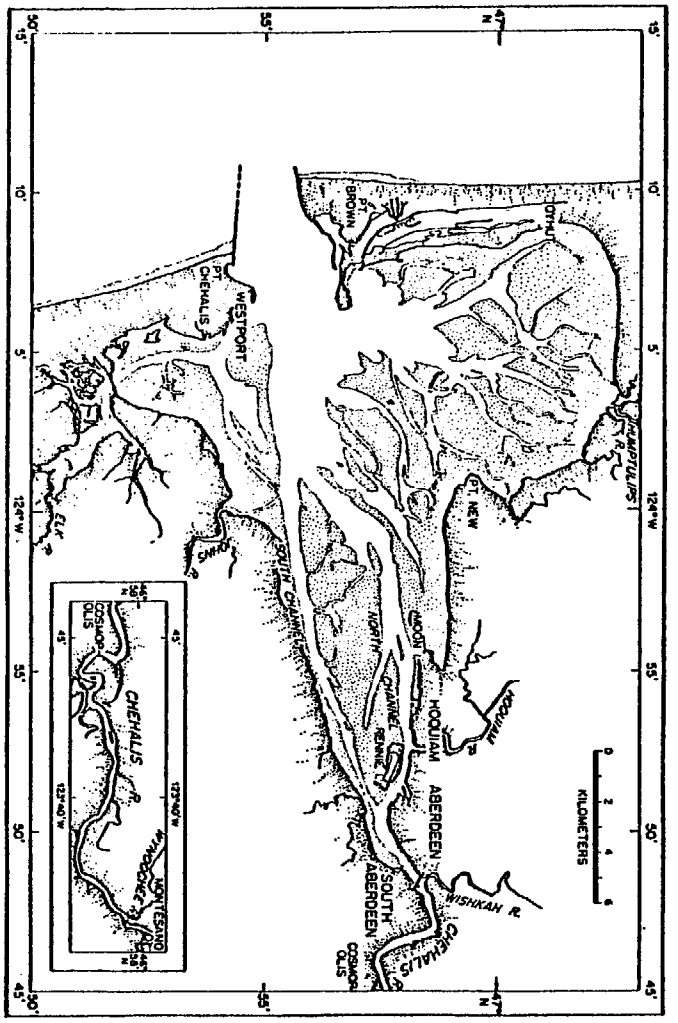


Figure 1. The Grays Harbor Estuary, Grays Harbor, WA

and logging. Because of its shallow depth, there have been numerous dredge and fill activities in the harbor since the early 1900's. Records between 1940 and 1976 indicate that approximately 3,850 acres (1,559 ha) of intertidal lands in Grays Harbor, including portions of Bowerman Basin, have been used for dredge material disposal (Smith and Mudd 1976). This figure represents 11.5 percent of total intertidal lands (33,600 acres or 13,598 ha) in the estuary for an average annual change of 110 acres (44.5 ha). Conservative estimates indicate at least 1,540 acres (623 ha) of vegetated wetlands have been permanently committed to upland use. Thus a significant part of the estuary has been modified due to man-made causes. Level land is scarce and has generally been created by the processes of estuarine deposition and man-made fill.

Management Plan

The GHEMP is a management plan that guides future decisions for the next 50 years related to the use of the estuary. The plan is the result of interagency cooperation and efforts. It attempts to provide a balance between the human use of the estuary to meet the region's social and economic needs and the need to conserve and protect the long-term productive capacity of the estuarine ecosystem and its related recreational and natural values. An annual and more substantive five-year review will be conducted to evaluate the effectiveness of the plan. Without the plan, the undirected piece-meal approach to development, with the subsequent loss of important ecological values that has been so prevalent in the past, will undoubtedly continue. The proposed plan concentrates new economic developments requiring intertidal fills in a few areas while protecting most of the rest of the estuary.

GHEMP is a three-tier policy plan which recognizes that one set of policies applied to the entire estuary cannot provide adequate guidance to property owners and government decisionmakers. The first policy level is the overall goal to "manage the estuary for the multiple uses which it can provide." Types of uses include: port facilities, manufacturing, transportation, food industry, commercial, recreation, residential, agricultural, fish and wildlife habitat, and natural areas. The plan attempts to accomodate each of these diverse uses in a practical and environmentally sound way.

The second level broadly categorizes uses of land and water into eight planning areas based on a common set of natural and man-related features including land ownership, political jurisdictions, existing uses, areas of existing or possible conflict, and physical boundaries or features. The planning areas provide a basis for describing how different areas of the estuary function and how they might function in the future. Each planning area is described in terms of its existing character, its major committed uses, its conflicts and assets, and includes recommended planning guidelines for the future use of the area.

The third level of policy in the plan, the Management Unit, is the most specific level and is designed to give guidance to property owners and government agencies in evaluating project proposals. The plan establishes forty-four (44) Management Units (Fig. 2), each classified as one of the following: natural, conservancy natural, conservancy managed, rural agricultural, rural low intensity, urban residential, urban mixed and urban development.

The largest and most controversial area for new development is the area north and west of Bowerman Airport. This area contains 2,200 acres owned by the Port of Grays Harbor and, in the November 1980 GHEMP, is divided into approximately 500 acres of developable (Management Unit 13) and 1,700 acres non-developable (Management Unit 12) wetlands. Previous drafts of the plan have called for speculative filling of the first 250 acres of Unit 13 before tenants were identified or uses determined. There was also some discussion of predesignating Unit 13 as a dredge disposal area for the proposed Grays Harbor Deepening and Widening project. The current proposal presented in your Biological Assessment of November 24, 1980, eliminates the speculative fill of Unit 13 and does not designate Unit 13 as a dredge spoil disposal area for the deepening and widening project. It may be used for other dredge disposals if the EPA/Corps 404 permit requirements are met. These requirements are: 1) that the activity associated with the fill is either water-dependent or there is no practicable site or construction alternative for the activity; 2) that there is a need for the proposed activity; 3) that there are no less environmentally damaging alternatives; and 4) that there are no unacceptable adverse impacts to the aquatic ecosystem from the fill and the activity associated with it.

In concert with this development scheme, Unit 12, the area west of the end of the airport, would be set aside for non-development. This set aside would be assured by two levels of protection: the area is set aside in the plan for fish and wildlife and the Corps cannot issue permits for development in the area because of consistency provisions in the Coastal Zone Management Act. Another level of protection would be provided through conservation easements or deed transfers of the port's land title to Washington Department of Game and possibly the Service, as permits in Unit 13 are granted. The proportion is approximately 3 acres in Unit 12 set aside for each acre filled in Unit 13, so that if all of Unit 13 is developed, all of Unit 12 would be transferred to a resource agency.

Two plans are now being been discussed as to how port development would be accomplished. The original plan is identified in the GHEMP under Unit 13. In public meetings held on December 8-10, 1980, and in an addendum to the OCZM biological assessment dated January 6, 1981, an alternative plan for development was proposed which OCZM postulated would not impact Bowerman Basin as severely as the first plan. While the exact configuration and specifications of the alternative are not yet decided, Figures 3 and 4 suggest two possible configurations, as supplied by OCZM. This included filling along the existing pennisula while leaving the major portion of tidal flats and marsh in Bowerman Basin unaltered.

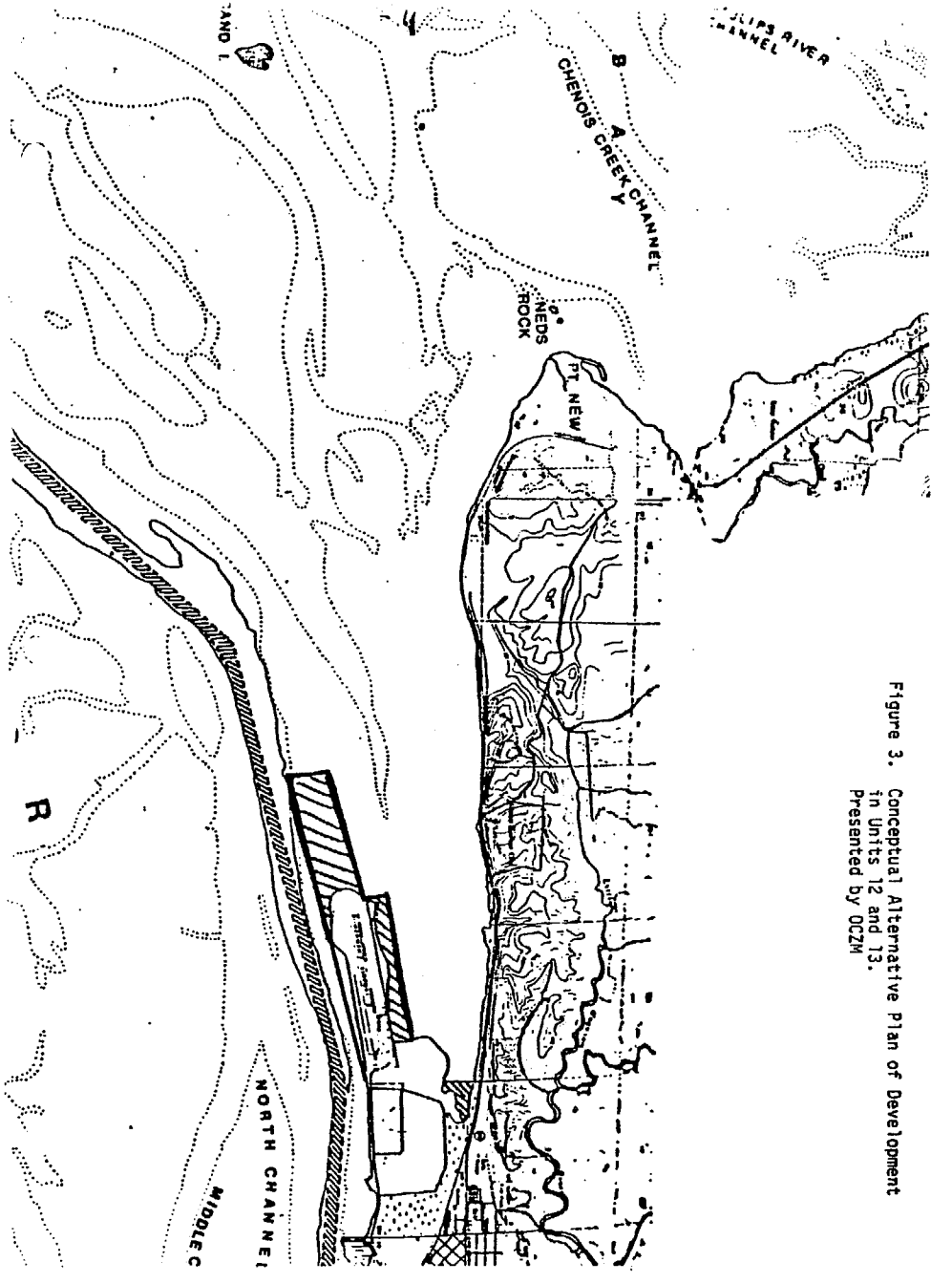


Figure 3. Conceptual Alternative Plan of Development in Units 12 and 13. Presented by OCZM

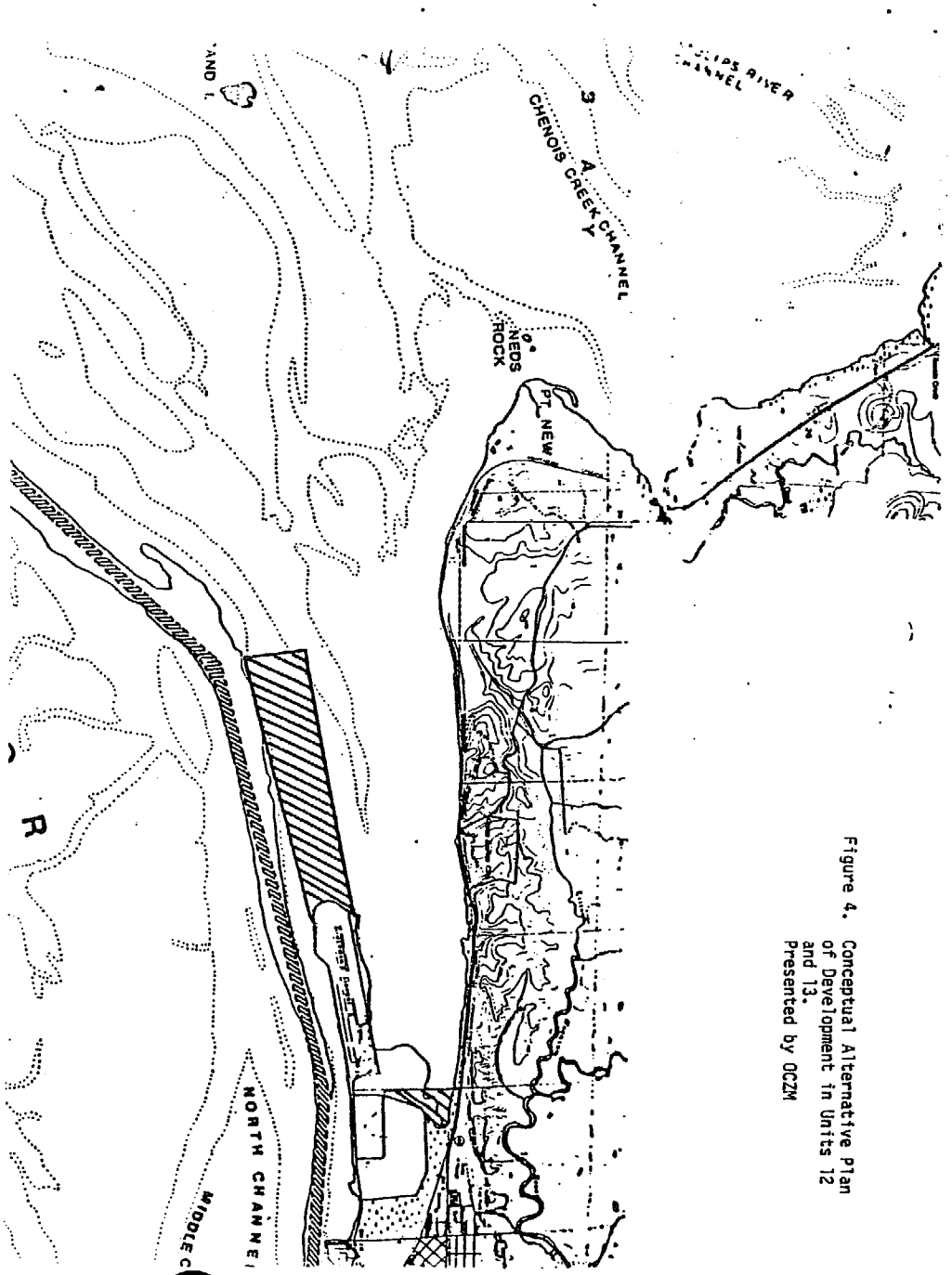


Figure 4. Conceptual Alternative Plan of Development in Units 12 and 13. Presented by OCZM

Species Account

There are deficiencies concerning all aspects of the ecology and distribution of peregrine falcons, not only from Grays Harbor, but with the entire northwest populations of the two endangered sub-species. However, there does exist a broad, though not always site-specific information base available from documented field studies and the personal knowledge and educated assumptions of qualified researchers that encompass these aspects. Among others, these aspects include: population size and distribution, speciation, migrational patterns and habits, food requirements and feeding habits, behavior (both innate and learned), spatial and temporal relationships within their environment, ecological requirements and responses to perturbations, both natural and human-induced.

The following account has been developed to summarize some of the available information, from the general to the specific, as it relates to the intricate predator-prey relationship of the peregrine and its food base. The attempt has been made, through this overview, to document, indicate, and emphasize the apparent importance of Grays Harbor, in particular the Bowerman Basin area, to the well-being of the peregrine falcon.

Washington State has had the highest number of recorded winter sightings of peregrine falcons in the western United States (Anderson 1981), with Grays Harbor being one of four nationally known areas where peregrine falcons can be observed during winter on a predictable basis. Observations of peregrines at Grays Harbor have been documented during all four seasons (Dobler 1980) indicating important values exist in addition to winter requirements. However, winter habitat is an essential component for the welfare of this falcon, yet it occurs in limiting quantities in Washington State (Anderson 1981). The vast number of shorebirds and waterfowl using Grays Harbor is the likely reason peregrines concentrate in this bay (Herman 1981, Paulson 1981). There is no record of nesting in the area. The lack of suitable cliffs in the Grays Harbor area seemingly precludes nesting of peregrine falcons.

Peregrines have been observed at Grays Harbor most notably during the fall, winter and spring. They utilize the abundant preybase of shorebirds and waterfowl (Smith and Mudd 1976, Herman 1981, Paulson 1980). Observations and morphological characteristics of falcons trapped on the Skagit Flats, about 140 airmiles to the northeast (Anderson and Debruyn 1979), suggest the majority of peregrines wintering at Grays Harbor are the subspecies natum rather than Peales peregrines (F. p. pealei), a subspecies indigenous to the northwest maritime area which is not listed as threatened or endangered. Arctic peregrine falcons (F. p. tundrius) have also been collected and observed (Herman and Anderson 1981). Arctic peregrine falcons from Alaska may be utilizing the preybase at Grays Harbor during spring and fall migrations. The peak spring (late April-May) and fall (September-October) migrations of shorebirds recorded at Bowerman Basin (Smith and Mudd 1976, Gill 1981, Herman 1981) tend to coincide with migration dates of early May and mid-September when peregrine falcons return and leave Alaska (Jurs 1978).

There is sufficient documentation to conclude that peregrine falcons are opportunistic feeders and that the bulk of their diet consists of a variety of birds. However, it must be noted that there exists an age and sex differential preference for prey items and with foraging strategies. Adult females, being larger than males, show a marked ability to pursue and catch larger prey such as waterfowl. The smaller adult males and immature birds that have not developed refined hunting strategies tend toward the pursuit of smaller prey with a higher success rate of kill (Hunt, et al. 1975, Anderson and DeBruyn 1979, and others). Recent records (1972-1981) from Grays Harbor (Herman and Anderson 1981) indicate that the majority of birds utilizing the area are adult males and immature birds of both sexes. This is in contrast to the high numbers of adult females, and subsequent use of waterfowl as a food source, on the Skagit Flats (Anderson and DeBruyn 1979). Other data collected by Herman (1981) show the peregrine falcons in Grays Harbor, including adult females, to be pursuing and catching primarily dunlin (Calidrus alpina) and to a much lesser extent western sandpiper (Calidrus mauri) and waterfowl. Waterfowl are present in lesser numbers in Grays Harbor than are shorebirds and are much more broadly distributed (Smith and Mudd 1976). Unlike the situation observed on the Skagit Flats in the Anderson and DeBruyn studies (1979), waterfowl at Grays Harbor are not as susceptible to being killed by peregrine falcons. Their studies revealed the majority of successful pursuits by falcons occurred when waterfowl were engaged in feeding forays in croplands and pastures. Due to the lack of extensive crop and pasturelands adjacent to Grays Harbor, waterfowl spend the majority of their time feeding and loafing on or near the water, a position which may render them less susceptible to being killed by falcons.

Peregrine falcons have been recorded from all areas of the estuary. However, there appears to be a time-sequential mode to the observations. Collection around the turn of the century, before serious man-induced modifications, were most frequent at Westport. Latter sightings were most frequently recorded on or near the Ocean Shores peninsula with a progression to the North Bay area. Sightings are still made in these areas, at South Bay and along the southern channel. However, recent sightings have trended toward the vicinity of Bowerman Basin and to the west of Moon Island (GHEMP Units 12 and 13). A minimum of 33 sightings have been documented in these two units from 1972-1981, with a maximum of three individuals observed in one day, with substantially fewer sightings documented elsewhere in the estuary (Herman and Anderson 1981). The actual number of peregrines utilizing Grays Harbor on an annual basis is unknown. A conservative, qualitative evaluation, based on past sightings and knowledge of the area, indicates that 12 peregrine falcons may be overwintering at Grays Harbor in addition to those present during the fall migration and in the spring (Herman 1981). However, one of the obvious and serious data deficiencies on falcons occurring in Grays Harbor is exact knowledge of precise routes of migration and precise wintering grounds used by these populations, as well as temporal and spatial distribution within Grays Harbor.

The distribution of shorebirds, primarily dunlin, which are the most prevalent birds in Grays Harbor, is not evenly spaced (Smith and Mudd 1976, Herman 1981). Shorebird numbers have reached recent highs of over 400,000 in late April (Herman 1981) in Bowerman Basin. The dunlin comprised the vast majority of these birds. Smith and Mudd (1976) recorded migration peaks of 156,000. They also recorded shorebird winter use (December-March) to be 20,000 to 37,000, with dunlins comprising from 60 to 98 percent of the birds present on the tidal mudflats and western sandpipers comprising 1 to 31 percent. Recent surveys (Herman 1981) indicate that an average of 12,000 to 15,000 dunlin utilize Bowerman Basin for feeding activities in winter. When considering recent simultaneous surveys of the entire Grays Harbor estuary, such as the 1980 Audubon Christmas Bird Counts, Bowerman Basin (GHEMP Unit 13) and the area immediately to the west (GHEMP Unit 12) held about 63 precent (17,850) of the dunlin, the most frequently recorded species in the estuary. It is not unlikely that there is substantial use by dunlin of other areas of the estuary for feeding and roosting, depending on weather and tidal factors (Paulson 1980, Herman 1981), but it is evident that GHEMP Units 12 and especially 13 are the areas preferred and most heavily utilized by dunlin and subsequently peregrine falcons. A review of topographic charts and recent aerial photos indicate that Bowerman Basin and much of Unit 12 to the west are the last mudflats to be covered by tidal water and the first to be revealed as the tide recedes. Furthermore, it appears that Grays Harbor and particularly Units 12 and 13 have had the largest concentrations of dunlin of any estuary along the Pacific coast (Paulson 1980). No other estuaries that support the same magnitude of shorebirds exists between Grays Harbor and Alaska. It should be noted that avian species other than dunlin utilize Units 12 and 13. Herman (1981) offered records showing 62 species of waterbirds and raptors occurring in these units. Twenty-two of these species were shorebirds.

There is a consistent pattern of dunlin use in Grays Harbor. Herman (1981) and Paulson (1981) both report that birds normally approach the management units in question, GHEMP Units 12 and 13, from the southwest and southeast, flying around the tip of Bowerman Field and landing on exposed portions of tidal mudflats, primarily the north side of Bowerman Field and the east end of Bowerman Basin. As the tide recedes, birds continue moving onto the exposed mudflats. Peregrine falcons apparently follow the same pattern based on distribution and abundance of birds. Dunlins utilize the high marsh at the east end of Unit 13, around Little Moon Island in Unit 12 and the tip of Bowerman Field for roosting at night and during high tides. However, these areas do not support all of the birds. The largest roosting areas are unknown but indications are that they may occur to the south (possibly along the south channel) and possibly in the vicinity of North Bay and South Bay. Paulson (1981) also believes that more than one roosting area is essential. As was mentioned earlier, the dunlin also make use of feeding areas other than Units 12 and 13 as they are opportunistic feeders. Other areas may also serve as overflow sites but may be of less value as indicated by similar studies conducted by Page, et al. (1979), Gerstenberg (1979) and Goss-Custard (1967). Furthermore, Smith and Mudd (1976) believe that shorebird feeding habitat is a limiting factor in Grays Harbor.

Of further importance is the fact that dunlin and western sandpipers are philopatric species in that they select certain specific areas for their activities and utilize these same areas annually, even when other seemingly suitable habitat is nearby (Jehl, Jr., 1979, Gill 1981, Stenzel 1981, and others).

The extensive review by Smith and Mudd (1976), which addressed the relationship of Bowerman Basin to dunlins and peregrine falcons, is revealing. To summarize, the bulk of the dunlin's diet consisted of invertebrates, primarily the amphipods Corophium sp. and Anisogammarus confervicolous. They also supplement their diet with seeds from salt marsh plants. These seeds were usually consumed when high winter waters and high tides force the birds to feed on the salt marsh fringes. Esophageal contents of dunlin collected in Bowerman Basin consisted of 85.5 percent amphipods while those to the west in GHEMP Unit 12 contained 31.7 percent amphipods. Invertebrate sampling in those same areas showed densities of Corophium sp. of about 10,000-50,000 per M^2. The density was highest in Bowerman Basin and substantially lower in GHEMP Unit 12. Levels for both areas were highest in summer and much reduced in spring. Winter densities can be expected to be substantially lower. This is in concert with Smith's (1977) data that showed amphipods, particularly Corophium sp., capable of recolonizing mudflats within 30 days in summer and 90 days in winter, providing that sediment, water quality, and depth conditions are suitable. Abundance of invertebrates corresponded with patterns of observed feeding shorebirds.

This pattern of amphipod-dunlin-peregrine use is based on preferred or required amphipod habitat. These two species of amphipods are normally found in sediment sizes of 4 Phi or smaller (silty sand to silt-clay) and at elevations below +7 feet. These same conditions exist in Bowerman Basin and to a lesser extent in GHEMP Unit 12. Unit 12 has been recently modified by unconfined spoil disposal that has left more sand and higher elevations. It should be noted that this entire area (Units 12 and 13) has the most extensive area of silt-clay substrate, elevations below +7 feet in association with highwater roosting areas, and more protection from severe winter storms which are accompanied by high tides and influx of river water, than any other unit in Grays Harbor. These conditions have resulted in a mosaic of habitats that allow extensive and preferred utilization of the two units by dunlins and other shorebirds, and consequently, peregrine falcons.

Analysis of Impacts

The implemention of GHEMP will provide a predictable pattern of development for industry and conservation interests within the Grays Harbor area. Without implementation of the GHEMP, the undirected and unpredictable approach to development with the corresponding loss of ecological values will undoubtedly continue as it has in the past. The proposed GHEMP satisfies most of the recognized requirements for the protection of a variety of natural resources including peregrine falcons and their preybase.

However, one element of GHEMP, the development of Bowerman Basin for water-dependent industry could severely impact up to 400,000 shorebirds and 50,000 waterfowl by eliminating a seasonally-selected and used feeding area that is integral to the birds' well-being. Shorebirds tend to congregate and feed in the Basin during the fall to spring months, but use the area most intensively during the spring to build energy reserves prior to migrating to the Copper River Delta in Alaska (Gill 1981). Reasons for the heavy use by shorebirds in Units 12, and particularly 13, appear to be their philapatric nature, the site's high level of protection, high sustained preybase, and availability of nearby roosting habitat. This area increases in importance considering that quality shorebird feeding habitat may be a limiting factor at Grays Harbor (Smith and Mudd 1976).

A number of peregrine falcons, possibly as many as 12 in the winter in addition to others during the spring and fall, are dependent on these birds for sustenance while at Grays Harbor. Recorded sightings of peregrines indicate a predominance of adult males and immature birds of both sexes which can utilize the high densities of shorebirds more efficiently than they can utilize waterfowl. The reduction of the existing preybase, caused by filling and developing Bowerman Basin, will undoubtedly cause peregrine falcons to be displaced and will result in increased interspecific and intraspecific competition for the remaining food and winter habitat. This would cause additional stress and weight loss during winter which could affect productivity during the spring, by reducing or eliminating clutches laid by those female peregrines utilizing the Harbor. This potential decrease in productivity and increased stress within the juvenile segment of the population is especially significant in a race of birds already suffering a 50 to 90 percent mortality rate among juveniles (depending on the subspecies). The same physiological and reproductive problems may be encountered by shorebirds, particularly the dunlin. The value of winter habitat for dunlins and peregrine falcons is considered to be just as essential as nesting habitat for the survival of the species by those authorities personally contacted by this Service during the consultation period.

To what extent the surrounding habitat in Grays Harbor and adjacent estuaries can absorb the displaced shorebirds and waterfowl populations is unknown but appears to be limited due to the intrinsic factors discussed above. Furthermore, peregrine falcon wintering habitat is limited in Washington with falcons showing a marked loyalty to known sites (Anderson 1981) indicating that the quality and not quantity alone may be an important consideration. Because other areas in Grays Harbor support a diverse preybase, peregrine falcons will probably still utilize Grays Harbor. However, the reduction of habitat at Bowerman Basin (up to 500 acres) and the corresponding loss of preybase will probably decrease peregrine numbers, as well as frequency and duration of use. Anderson (1981) believes any loss of known wintering habitat will result in a reduction of the peregrine falcon population. Considering the disruption of the biological mosaic at Bowerman Basin and the unknown quantitive aspects, particularly the actual total number and extent of use by the already

endangered peregrines in Grays Harbor (possibly 12 in the winter with additional birds in the fall and spring), the Service finds the cumulative effects to be significant. Therefore, the Service's opinion is that development plans for Management Unit 13 in the proposed GHEMP as presented in the biological assessment of November 24, 1980, is likely to jeopardize the continued existence of the peregrine falcon (both listed subspecies).

We are also of the opinion that the alternatives presented in the OCZM January 6, 1981 correspondence may jeopardize the continued existence of the peregrine falcons (both listed subspecies). Because of the unknown parameters involved with this alternative (i.e., total area and placement of fill, timing of construction, and hydrologic patterns in Units 12 and 13), OCZM cannot insure that their actions will not violate Section 7(a) of the Endangered Species Act. However, if appropriately constructed, the preybase for the peregrine falcons could be protected not only in Unit 13 but in Unit 12 as well.

Reasonable and Prudent Alternatives

The 1978 amendments to the Endangered Species Act include a mandate that "reasonable and prudent alternatives" be suggested when a biological opinion indicates jeopardy to a listed species. Reasonable and prudent alternatives refer to alternative courses of action open to the Federal agency with respect to an activity or program that are technically capable of being implemented and consistent with the intended primary purpose of the activity or program. We believe either of the two following alternatives, if implemented, will avoid jeopardy to the species.

1. Confine the area and direction of water-dependent development to the south side of Bowerman Field out to the navigation channel then east. Maintain the existing protection and low-level human disturbance being offered on Moon Island (Bowerman Field). This would exclude filling and development in Bowerman Basin and Unit 12. All fill materials should be free of pesticide residues.

OR

2. The following recommendations relate to the alternative offered by the OCZM in the January 6, 1981 addendum to the biological assessment. All should be implemented as part of this reasonable and prudent alternative should it be the decision of the Task Force and OCZM to pursue development in Management Unit 12.

A. Filling should not occur on the north side of Bowerman Field, within Bowerman Basin nor west of the Hoquiam City limits. Any extension of Moon Island (Bowerman Field) should not connect with Little Moon Island, i.e., leave a channel between the two. The present low-intensity disturbance associated with Bowerman Field should be maintained, as well as the protective buffer strip along the north side of Bowerman Field, the north side of the proposed development, and at the east end of Bowerman Basin.

B. All fill materials used in conjunction with this alternative should be free of pesticide residues.

C. Studies should be implemented to determine the natural productivity of the area west of Moon Island (Bowerman Field) and to determine the most acceptable time-frame for fill and construction activities. In conjunction with this, hydrologic studies should be conducted to determine present and future suspected current and sediment transfer and deposition conditions. These hydrologic studies are needed to assure that a change in existing landforms will not modify tidal exchange and flushing; and subsequently water quality, rate and direction of sediment deposition, and sediment size. Adverse changes of these unquantified parameters could impact shorebird feeding and roosting habitat.

D. Studies to monitor invertebrate productivity, shorebird use, and peregrine falcon use of Grays Harbor with emphasis on Units 12 and 13 should be conducted before, during and after construction in order to assess the impacts or significant changes that may occur. This would facilitate redirection of development should substantial declines in productivity, shorebird and peregrine falcon utilization occur. Shorebird and peregrine studies should include marking and possibly telemetry work to assess the predator-prey relationship, origin and migration routes of peregrines and utilization of Grays Harbor by both shorebirds and peregrines.

E. If feasible, depending on the results of the above studies, create new feeding and roosting habitats in Unit 12 to replace those lost to development.

F. Once a development plan is forthcoming, assess proposed industrial activities as to their compatibility with shorebird and peregrine falcon utilization. The consultation process should remain open with opinions being rendered and allowed development occurring in a stepwise manner as allowed under Section 7(a)(2) of the Act.

Conservation Measures

Sections 2(c) and 7(a)(1) of the Endangered Species Act require Federal agencies, in consultation with the Service, to utilize their authorities to carry out programs for the conservation of listed species. In this case, "conservation" means to take actions to assure the recovery of the species. We believe that the Office of Coastal Zone Management has the opportunity to fulfill this mandate by considering the following course of action.

OCZM should continue active involvement in estuarine planning both in Grays Harbor and other coastal areas supporting peregrines. Within the context of GHEMP, OCZM and the Task Force could make one of its planning goals, the recovery of the peregrine falcon. This would necessitate that the peregrine be given equal consideration when developing, revising or updating the plan, and may require shifting locations for planned development. To adequately consider the survival needs of the peregrine in Grays Harbor, studies (as described in Item D above) will be required.

Summary

In summary, we believe that implementation of the reasonable and prudent alternatives would eliminate the jeopardy opinion for the original GHEMP and the "may jeopardize" opinion associated with the alternative plan while furthering the intent of Sections 2(c) and 7(a)(1) of the Act. Consideration and implementation of the conservation measures as the plan of development would not jeopardize the continued existence of the peregrine falcon and would further the intent of Section 7(a)(1) by enhancing the possibilities of recovery for the peregrine falcon.

We prefer to keep the consultation process open as allowed under Section 7(a)(2) of the Act. It can be of an informal nature until step-wise studies are completed and development plans put forth. This would require intermediate formal consultation and biological opinions for each phase of study completion and project development. This suggestion is premised on the assumption that your agency will continue the planning process with these recommendations in mind and will concur with continuing consultation, both formal and informal. If your decision is to not continue consultation at this time, we recommend reinitiating the formal consultation procedures if the proposal is significantly modified or if new information is learned about the peregrine falcon that could change the conclusions of this opinion. Reinitiation of the consultation process could occur in conjunction with the GHEMP Task Force's annual or five-year review of the plan.

We appreciate your cooperation and assistance in meeting our joint responsibilities under the Endangered Species Act of 1973, as amended and are cognizant of the difficulties in formulating a plan with so many diverse concerns and interests. We look forward to continuing to work closely with your agency on the Grays Harbor Estuary Management Plan.

Sincerely,

Joseph R. Blum
Area Manager

JRB/jlr

Attachments

cc: Regional Director

REFERENCES

Anderson, C.M. 1981. Personal communication. Bellevue, WA.

Anderson, C.M., and P.M. DeBruyn. 1979. Behavior and ecology of peregrine falcons wintering on the Skagit Flats, Washington. Contract #WDG-PF-79-1. 53 p.

Dobler, F. 1980 and 1981. Personal communication. Washington Department of Game, Olympia, WA.

Gerstenberg, R.H. 1979. Habitat utilization by wintering and migrating shorebirds on Humboldt Bay, California. Studies in Avian Biology No.2:33-40.

Herman, S.G. 1981. Personal communication. The Evergreen State College, Olympia, WA.

Herman, S.G., and C.M. Anderson. 1981. The peregrine falcon at Grays Harbor, Washington (draft manuscript).

Gill, R. 1981. Personal communication. U.S. Fish and Wildlife Service, Anchorage, AK.

Goss-Custard, J.D. 1979. Effect of habitat loss on the numbers of overwintering shorebirds. Studies in Avian Biology No.2:167-177.

Hunt, W.G., R.R. Rogers, and D.J. Slowe. 1975. Migratory and foraging behavior of peregrine falcons on the Texas coast. The Canadian Field Naturalist, 89:111-123.

Jehl, J.R., Jr. 1979. Summarizing remarks, Part 1. Studies in Avian Biology No.2:179-181.

Jurs, L. 1978. Peregrine falcon recovery effort in Alaska. *In:* Peregrine falcon populations in North America. Eds. P. Schoeffer and S. Ehlers. Western Audobon Society. Tiberon, CA. 67 p.

Office of Coastal Zone Management. 1980. Biological assessment for Endangered Species Act section 7 consultation. 34 p.

Office of Coastal Zone Management. 1981. Addendum to biological assessment for Endangered Species Act section 7 consultation, Grays Harbor, WA. 4 p.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Area Office
Washington and Oregon
2625 Parkmont Lane
Olympia, Washington 98502

December 11, 1981

Mr. Charles N. Ehler, Director
Office of Resource Coordination
and Assessment
Office of Coastal Zone Management
Washington, D.C. 20235

Dear Mr. Ehler:

This is the U.S. Fish and Wildlife Service's (FWS) reply to your letter of October 29, 1981 which was received November 2, 1981 for reinitiation of formal consultation (#1-3-82-F-304) on the revised Grays Harbor Estuary Management Plan (GHEMP), Grays Harbor County, Washington. This consultation addresses the impacts of implementation of the revised GHEMP on the American peregrine falcon (Falco peregrinus anatum) and Arctic peregrine falcon (Falco peregrinus tundrius). Both subspecies are federally listed as endangered in Washington. Your request for formal consultation and this response are made pursuant to Section 7 of the Endangered Species Act of 1973, 16 U.S.G. 1531, et seq.

On March 13, 1981 we issued a biological opinion (# 1-3-81-F-407) on the original plan and an alternative plan to your agency. That opinion (Attachment 1) concluded that implementation of the original plan would jeopardize the continued existence of listed peregrine falcons and that the conceptual alternative plan may jeopardize the continued existence of endangered peregrine falcons. We also concluded that neither plan would jeopardize the northern bald eagle (Haliaeetus leucocephalus alascansus), listed as threatened in Washington, or the California brown pelican (Pelicanus occidentalis californicus), listed as endangered in Washington.

Since issuance of our biological opinion on March 13, 1981, a mini-task force comprised of federal and state resource agency and local representatives have proposed revisions to the GHEMP. The goal of the revision has been to remove features of the plan creating the jeopardizing elements to the peregrine falcon while maintaining the original multiple-use features of the plan.

An extensive review of the pertinent literature and contact with persons with special expertise or knowledge of peregrine falcon biology were utilized during the course of our review for our March 13, 1981 biological opinion. The information garnered from the original review was also used in the formulation of this opinion on the revised plan. Our review was completed on December 2, 1981. Individuals contacted were Dr. Steven G. Herman, The Evergreen State College, Olympia, Washington; FWS biologists Robert Gill, Jr., Anchorage, Alaska; Jeffrey Opdycke, Olympia, Washington; and Ulrich Wilson, Ilwaco, Washington; Jeff Dorsey, Corps of Engineers, Portland, Oregon; and the following Canadian Wildlife Service biologists in Delta, British Columbia: Sean Boyd, Gary Kaiser, and Kathleen Fry. Furthermore a team of biologists was assembled that conducted an on-site inspection and review of the modified GHEMP on November 30 and December 1, 1981. Those team members were Fred Dobler, Washington Department of Game; Charles Bruce, Oregon Department of Fish and Wildlife; and Dave Harlow, Wayne White, and Jim Bottorff, all of the FWS.

Several other published and unpublished documents were used to formulate this opinion in addition to those cited in our earlier opinion. A key document was Herman and Bulger's (1981) report on shorebird use of Grays Harbor during the spring migration. This paper also presented new information on peregrine falcon utilization of the estuary. Shorebird utilization (primarily dunlin and western sandpipers) of both disturbed and undisturbed sites in the Fraser River estuary of British Columbia were addressed by Fry (1980 and 1981) and Kaiser (1981). The Fraser River estuary was visited on November 15-16 because of the relevancy and similarities of development projects to those proposed in GHEMP.

Biological Opinion

It is the Service's biological opinion that the implementation of the revised GHEMP is not likely to jeopardize the continued existence of the endangered peregrine falcon. This opinion is based on our present understanding of the plan and existing information related to peregrine falcon biology and utilization of Grays Harbor.

Our analysis of the effects of the revised GHEMP on peregrine falcons was based on the following assumptions, which are not clearly defined in the plan:

1. Shorebird and peregrine falcon habitat will be re-created on the edges of new fills at Bowerman Basin.

2. Area 2 will be filled and developed before Area 3.

3. Monitoring studies will continue prior to, during, and after placement of fill at designated areas.

4. If monitoring studies show that peregrine falcons are being adversely affected through loss of prey species by the initial fill projects (e.g., Area 2), consultation will be reinitiated and the plan amendment process can be instituted.

Page, G.W., L.E. Stenzel, and C.M. Wolfe. 1979. Aspects of the occurrence of shorebirds on a central California estuary. Studies in Avian Biology No.2:15-32.

Paulson, D.R. 1980. The importance of Grays Harbor, especially to migrating and wintering shorebirds of the Pacific Coast. Written testimony presented at December 10, 1980 Grays Harbor Estuary Task Force Meeting, Aberdeen, WA.

Paulson, D.R. 1981. Letter of February 12, 1981 from Paulson to Eric Cummins, Washington Department of Game, Aberdeen, WA.

Smith, J.L. and D.R. Mudd. 1976. Impact of dredging on the avian fauna in Grays Harbor. *In:* Maintenance dredging and the environment of Grays Harbor, WA. U.S. Army Corps of Engineers, Seattle District. Appendix H. Work performed under Washington Department of Ecology Contract #74-164. 217 p.

Smith, J.E. 1977. A baseline study of invertebrates and of the environmental impact of intertidal log rafting on the Snohomish River Delta. Final Report, Washington Coop. Fish. Res. Unit, Univ. of WA, Seattle, WA. 84 p.

Project Description

The project site includes all of Grays Harbor (Figure 1) from the end of the harbor entrance jettys up to the junction of the Chehalis and Wynoochee rivers south of the town of Montesano. Over 60,000 acres are inundated at mean higher high water (MHHW). At mean lower low water (MLLW), about 37,000 areas of tideflats are exposed. The harbor is about 60 miles west of Olympia, Washington and about 45 miles north of the mouth of the Columbia River.

A summary of the concepts of the GHEMP were presented in our March 13, 1981 biological opinion. Portions of that summary are presented here.

Management Plan

The GHEMP is a management plan that guides future decisions for the next 50 years related to the use of the estuary. The plan is the result of interagency cooperation and efforts. It attempts to provide a balance between the human use of the estuary to meet the region's social and economic needs and the need to conserve and protect the long-term productive capacity of the estuarine ecosystem and its related recreational and natural values. An annual and more substantive five-year review will be conducted to evaluate the effectiveness of the plan. Without the plan, the undirected piecemeal approach to development, with the subsequent loss of important ecological values, that has been so prevalent in the past will undoubtedly continue. The proposed plan concentrates new economic developments requiring intertidal fills in a few areas while protecting most of the rest of the estuary.

The revised plan does not deter from the above concepts. Specific implementation details are addressed in the June 1981 revised draft GHEMP and a November 1981 revision specific to Bowerman Basin. Deviation from the original plan addressed in our March 1981 opinion and the revised plan occurs in Management Unit (M.U.) 12 (formerly M.U. 12 and 13). This deviation is the subject of this biological opinion.

Management Unit 12 (Figure 2), Bowerman Basin, contains approximately 2,200 acres of intertidal wetlands and shallow subtidal waters. It is mostly owned by the Port of Grays Harbor with a small area owned by the City of Hoquiam. Significant natural features include Moon Island, site of the Bowerman Field airport; Mini-Moon Island, an unconfined dredge disposal site created in the early 1970s; and the intertidal mud- and sandflats and subtidal shallows north and west of Moon Island. A row of north-south oriented pilings extend from the western tip of Moon Island to the north shore of Grays Harbor.

Earlier versions of the plan called for filling the entire area of the approximately 500 acres of intertidal mudflats north of Moon Island. The present pattern of filling and development as depicted in Figure 2 identifies 237 acres for filling as part of the first phase (Phase I) of development. From west to east, this includes Area 2, about 164 acres at the western end of Moon Island. Also, a maximum of 73 acres (Area 3)

north of Moon Island would be made available for utilization as an airport after the existing airport is firmly proposed for water-dependent industrial activities. Area 5 (about 17 acres) is owned by the City of Hoquiam and would be available for development. The exact location of Area 4 will be determined after Phase I, but conceptually, Area 4 may be located west of Area 2 and encompass Mini-Moon Island. It contains about 246 acres and is part of the Phase II plan of development, which is allowable after: total utilization of the other fill sites in Grays Harbor, a showing of no unacceptable adverse environmental impacts and demonstration of need. About 1,700 acres of intertidal wetlands occur in Area I. This land would be deeded to the Washington Department of Game at the rate of 3.4 acres for every one acre in Units 2, 3, and 4 that are filled.

It is our understanding that several protective measures are being incorporated into the revised GHEMP as it pertains to M.U. 12. These include a re-creation of the vegetated salt marshes and woody vegetation buffers along the north side of the fill areas similar to what presently exists north of Moon Island. Furthermore, small pilings that occur within the existing wetland fringe would be replaced north of the proposed fill sites. These serve as perch sites for peregrine falcons.

Small islands (less than one acre) could be constructed north and/or west of the proposed fill sites. These could function as shorebird roost sites. It is also our understanding that biological studies will continue before, during and after placement of fill in the designated fill areas. Ongoing studies by WDG are directed at peregrine falcon distribution and utilization of Grays Harbor. Further studies would be needed after the Area 2 fill to determine impacts and utilization of Bowerman Basin by peregrine falcons and their local principal prey — shorebirds.

Species Account

The literature is replete with studies documenting reasons for the decline of the peregrine falcon. The pesticide DDT (and its derivatives, primarily DDE) has been the key factor in this decline. Eggshell thinning and subsequent hatching failures have resulted from contamination of falcon prey items, chiefly birds. Loss of habitat as a primary factor for declining populations has not been as severe as or well-documented as DDT contamination. Yet, many present falcon biologists believe that protection of both nesting and wintering habitat may be as important to recovery of the species. The major contribution that Grays Harbor adds to the maintenance of this species is its function as winter habitat.

A documented account of the species in general and specifically in Washington and Grays Harbor, was presented in our first opinion on the GHEMP. Basic conclusions were that:

1. Of those estuaries intensively studied, Grays Harbor is one of the most frequently-used estuaries during winter by peregrine falcons in the continental United States.

2. They have been observed during all seasons of the year, but most commonly in the fall and winter period. Frequent sightings during the short shorebird spring migration period are also common.

3. Peregrine falcons have been observed throughout Grays Harbor but most frequently in Bowerman Basin.

4. The primary food item in fall and winter at Grays Harbor has been shorebirds, with dunlin most heavily preyed upon.

5. Of those falcons identified as to sex and age, a preponderance of adult males and immature birds is evident. Due to their smaller size compared to adult females and the more inexperienced hunting capabilities of the juvenile birds, they can more successfully prey upon the small but extremely numerous shorebirds.

6. Shorebirds utilize all areas of Grays Harbor.

7. Bowerman Basin is the most extensively-used area by shorebirds within Grays Harbor. Some reasons for this are:

   a. Broad mudflats supporting high densities of invertebrates (principle food item of shorebirds) are the first to be uncovered during ebb tide and last to be inundated on the incoming tide.

   b. Roosting areas are immediately adjacent to feeding areas.

   c. The juxtaposition of roosting and feeding areas with other natural land features affords protection from almost all inclement weather conditions.

8. Other heavily utilized shorebird feeding and roosting areas occur in Grays Harbor – most notably the north bay and south bay areas. These sites do not offer all natural parameters found in Bowerman Basin; thus, they are less used.

A direct predator-prey relationship based on substrate – invertebrate density and distribution – shorebird density and distribution – peregrine falcon density and distribution is evident. The relationship of shorebird high-tide roost sites, available feeding areas, and protection from severe weather conditions must be factored into this relationship as well as perch sites for falcons and protection from over-harassment.

Other peregrine falcon food items such as waterfowl are found throughout Grays Harbor during the same periods as shorebirds, although in much lower numbers. Waterfowl distribution is much more even, with a greatly reduced dependency on Bowerman Basin.

It is known and documented that concentrations of shorebirds and waterfowl with subsequent peregrine falcon utilization occur in other estuaries of Washington. Willapa Bay and the lower Columbia River have been studied and observed; but total numbers, concentrations and utilization of the habitat by both shorebirds and peregrine falcons are less than at Grays Harbor (Crawford and Dorsey 1980, Widrig 1979, Wilson 1981) during the wintering period and fall and spring migration periods.

The most recent and comprehensive study to date of shorebird utilization during spring migration at Grays Harbor was conducted during the past spring by Herman and Bulger (1981). They found that almost one million shorebirds, primarily western sandpipers, occur at one time in Grays Harbor during the spring migration period. Such intensive shorebird use in other areas of the continental United States cannot be found in the literature. This period occurs from late April through early May. Just less than one-half (47%) of those birds could be found in Bowerman Basin at one time. Sixteen peregrine falcon sightings were also made during that period – about one-half in Bowerman Basin.

It appears that northward migratory shorebirds utilizing Grays Harbor follow the coastline to their breeding grounds in Alaska. The next major stopover after Grays Harbor is in the Fraser River estuary near Vancouver, British Columbia (Gill 1981 and Kaiser 1981). Southward-migrating shorebirds in the fall apparently use the same but reversed route.

Wintering use of Grays Harbor by shorebirds is less than one-tenth of the spring use at one time. However, use of the estuary in winter occurs for a much longer duration. Again, studies by Herman (1981) and Smith and Mudd (1976) showed that just less than one-half of the shorebirds (primarily dunlin) present in winter occur within Bowerman Basin.

These studies indicate the actual use of Grays Harbor by over-wintering and migrating shorebirds and the dominance of one site (Bowerman Basin - M.U. 12) within the estuary. Repeated observations by qualified observers have shown that shorebirds are the main prey item of peregrine falcons in Grays Harbor and that the falcons' distribution and abundance within the area may be directly linked to the shorebird's spatial and temporal patterns of use.

Analysis of Impacts

Area 2 and Area 5

Filling of the land owned by the Port of Grays Harbor, Area 2 (264 acres), and the land owned by the City of Hoquiam, Area 5 (17 acres), will cause the loss of some shorebird feeding and roosting habitat. Area 5 is not extensively utilized by shorebirds as a roost or for feeding, especially in winter. Area 2 is used primarily as a shorebird feeding and loafing area and, to a certain extent, for roosting. Its elevation is such that it is not exposed as long as tideland located further to the east within Bowerman Basin. Habitat within Area 2 will not be totally lost, since the protective measures that are part of the plan will partially compensate for this impact. These include sloping of the fill, re-creation of the fringe salt marsh, and a vegetated buffer zone. As this area presently extends to mudflats exposed only at lower tides, bank sloping will have the effect of raising the elevation of a portion of these mudflats and allowing a longer feeding period.

Concommitantly, peregrine falcons may be impacted if shorebird numbers are reduced. To what extent is not entirely known but the fills of Areas 2 and 5 do not in our opinion constitute jeopardy, in light of the highly

Editors Note: Area 5 has been changed to Area 7.

to carry out programs for the conservation of listed species. In this case, "conservation" means to take actions to assure the recovery of the species. We believe that the Office of Coastal Zone Management, in concert with all other federal agencies having regulatory authority associated with the implementation of the GHEMP, has the opportunity to fulfill this mandate by assuring the following recommendations are met:

1. Certain parameters associated with industrial development could have adverse impacts on peregrine falcons and their associated preybase – shorebirds. One factor to be considered is powerlines. We recommend that these utilities be installed underground to eliminate the possibility of lethal accidents associated with collisions.

2. Fill materials must meet EPA certification standards for DDT and its derivatives and filling should be implemented in such a manner as to assure that these harmful pesticides are not made available for resuspension and uptake into the aquatic ecosystem. DDT and its derivatives, primarily DDE, are directly responsible for the majority of peregrine falcon nesting failures due to egg-shell thinning. Without implementation of this measure, falcons could become contaminated through the food chain due to leaching of pesticides from contaminated fill materials.

3. Filling and activities associated with filling should be timed to have the least adverse impact on shorebirds and peregrine falcons. This time would probably be after the peak of spring migration and before the winter period. Advice on construction windows in between and possibly during the wintering and migration periods should be sought from FWS and WDG for each construction project.

Summary

In summary, we believe that implementation of the protective measures associated with M.U. 12 and the almost-total protection afforded the remainder of the estuary assures that GHEMP will not jeopardize the continued existence of the peregrine falcon. The GHEMP, as presently designed, allows for review of the project and redirection through the amendment process should new information concerning the peregrine falcon arise that requires a change of plan design and implementation.

This concludes formal consultation on this project. If the proposal is significantly modified in a manner not discussed above or if new information becomes available on listed species, reinitiation of formal consultation with this Service should be considered. We would appreciate notification of your final decision on this project.

Sincerely,

Joseph R. Blum
Area Manager

cc: SE-DC
RO-AFA-SE

Literature Cited

Crawford, J. and G. Dorsey. 1980. Final report for an evaluation of avian communities on dredged materials and undisturbed island habitats. U.S. Army Corps of Engineers, Portland District. Contract Number DACW57-78-C-0079.

Fry, K. 1980. Aspects of the winter ecology of the dunlin (Calidris alpina) on the Fraser River delta. Canadian Wildlife Service, Pacific and Yukon Region. 45 p.

——— 1981. Migratory bird use of sites affected by dredging activity in the Fraser River delta. Canadian Wildlife Service, Pacific and Yukon Region. Draft Report. 19 p.

Gill, R., Jr. 1981. Personal communication.

Herman, S. 1981. Personal communication.

——— and J. Bulger. 1981. The distribution and abundance of shorebirds during the 1981 spring migration at Grays Harbor, Washington. U.S. Army Corps of Engineers Contract # DACW67-81-M-0936. 64 p.

Kaiser, G. 1981. Migration of the western sandpiper (Calidris mauri) through the Fraser River delta of British Columbia. Canadian Wildlife Service, Pacific and Yukon Region. Delta, B.C. 16 p.

Levings, C. 1981. Preliminary results of Stevetson North Jetty-Sand Island #2 invertebrate recolonization studies. Dept. of Fisheries and Oceans, W. Vancouver, B.C. Unpublished draft. 6 p.

Smith, J. and D. Mudd. 1976. Impact of dredging on the avian fauna in Grays Harbor. In: Maintenance dredging and the environment of Grays Harbor, Washington. U.S. Army Corps of Engineers, Seattle District. Appendix H. Work performed under Washington Department of Ecology Contract #74-164. 217 p.

Widrig, R. 1979. The shorebirds of Leadbetter Point. Privately published. 57 p.

Wilson, U. 1981. Personal communication and notes. Willapa National Wildlife Refuge, USFWS.

mobile and adaptable nature of the peregrine falcons. Creation of new shorebird roosting and feeding habitat, in addition to the remaining acreage in Bowerman Basin and Grays Harbor, will assure that a continued supply of peregrine falcon prey items will exist, especially in winter when shorebird numbers are fewer than in the spring. Furthermore, secondary prey items such as waterfowl should be little affected by the proposed development.

Area 3

Because of this area's importance as feeding and roosting habitat, impacts to shorebirds and peregrine falcons may be more severe when and if the 73 acres in Area 3 are filled (north of Moon Island). However, the same protective measures associated with Fill Area 2 will be applied to this site as well. In addition, the creation of one or two small islands (less than one acre each west and/or north of Mini-Moon Island) could further offset impacts associated with this fill, especially the loss of high tide shorebird roosting habitat. Small dredge disposal islands have been created and the effects studied in the Fraser River Estuary of British Columbia (Fry 1981). Shorebird use was very high with as many as 25,000 dunlin utilizing three small islands the first winter after island construction. Areas above high water were mostly used for roosting.

Sloping of the islands could create intertidal feeding habitat that would be exposed for longer periods of time than presently exists. However, these islands and the re-creation of fringe marshes and sloped banks at Area 3 would not totally offset that habitat lost to filling. Increased stress through energy loss may occur if shorebirds are forced to seek roosting areas further removed from their feeding areas due to loss of habitat. Although secondary roosts (pastures, croplands, wet meadows) are not numerous around Grays Harbor, they are available and have been used (Herman and Bulger 1981). Furthermore, high tide roost sites adjacent to feeding areas are in short supply in the Fraser River estuary, yet shorebirds frequently utilize secondary upland roosts away from tideland feeding sites with no apparent adverse effects to the population (Fry 1980, Kaiser 1981). More reliance on upland sites may then become prevalent at Grays Harbor.

A quantifiable impact to peregrine falcons from filling and development of Area 3 and Moon Island will not be known until after Area 2 is filled and an analysis of shorebird and peregrine falcon response is made. Furthermore, as discussed in our original opinion, several data gaps concerning peregrine falcons at Grays Harbor still exist. These include total numbers, temporal and spatial distribution, territorial behavior, and speciation. Many of these questions are expected to be answered this winter through the ongoing studies of the Washington Department of Game. If ongoing peregrine studies and initial monitoring studies associated with the first area of filling and development indicate that Bowerman Basin is essential to the survival of listed subspecies of peregrine falcons and that wintering populations of their prey cannot be maintained in sufficient numbers to support peregrine falcons, then formal consultation and the plan amendment process will be initiated at the request of the FWS.

Effects of Substrates on Invertebrates

Any unconfined filling and sloping of fill-site banks may cause a short-term loss of invertebrates. This is especially true if a substrate material different from what presently exists is used. Heaviest shorebird feeding presently occurs on exposed mud (silt) flats. Corophium sp. is one of the food items most frequently eaten by shorebirds in Bowerman Basin. This crustacean occurs commonly in silt substrates and less frequently on sand substrates. However, Fry's (1980) work on the Fraser River Estuary showed dunlins to feed heavily on polychaetes in a sand substrate and Kaiser (1981) found western sandpipers gained weight in the spring, probably on the same diet. Recolonization by invertebrates on disposal sites has been extensively studied. Almost all studies reviewed have shown rapid recolonization (less than six months) to pre-fill levels. Leving's (1981) preliminary results revealed that total recolonization (primarily by polychaetes) occurred within three months when elevations were less than nine feet above chart data.

Summary of Impacts

Up to 254 acres (Fill Areas 2, 3 and 5) of shorebird feeding and roosting habitat may be lost during the Phase I development. An additional 246 acres (Fill Area 4) could potentially be lost in the Phase II Development if a determination of no unacceptable adverse environmental impacts is shown in conjunction with determinations of need and lack of alternative sites. Shorebird habitat existing within the area of the Phase I development will not be totally destroyed since protective measures will be implemented to minimize destruction. The remaining and new habitat within M.U. 12 and other areas of Grays Harbor should be capable of supporting a population of shorebirds sufficient to maintain the listed subspecies of peregrine falcons. Furthermore, secondary food sources (waterfowl) will receive very minimal impacts associated with development of M.U. 12 and almost total protection of their habitat in the remaining areas of Grays Harbor.

Based on the known plan of development presented in the GHEMP and based on the assumptions present above, it is our biological opinion that the revised plan of development presented in your letter of October 29, 1981 will not jeopardize the continued existence of the American peregrine falcon or the Arctic peregrine falcon. As defined in the Service's Interagency Cooperation Regulations published in the Federal Register (FR 875; 1/4/78), the phrase "jeopardize the continued existence of" means to "engage in an activity or program which reasonably would be expected to reduce the reproduction, numbers, or distribution of a listed species to such an extent as to appreciably reduce the likelihood of the survival and recovery of that species in the wild". We do not believe that the evidence presented at this time, in light of the November 1981 revision and the continued flexible nature of the GHEMP, would result in a jeopardizing situation for the continued existence of peregrine falcons.

Conservation Measures

Sections 2(c) and 7(a)(1) of the Endangered Species Act require federal agencies, in consultation with the Service, to utilize their authorities

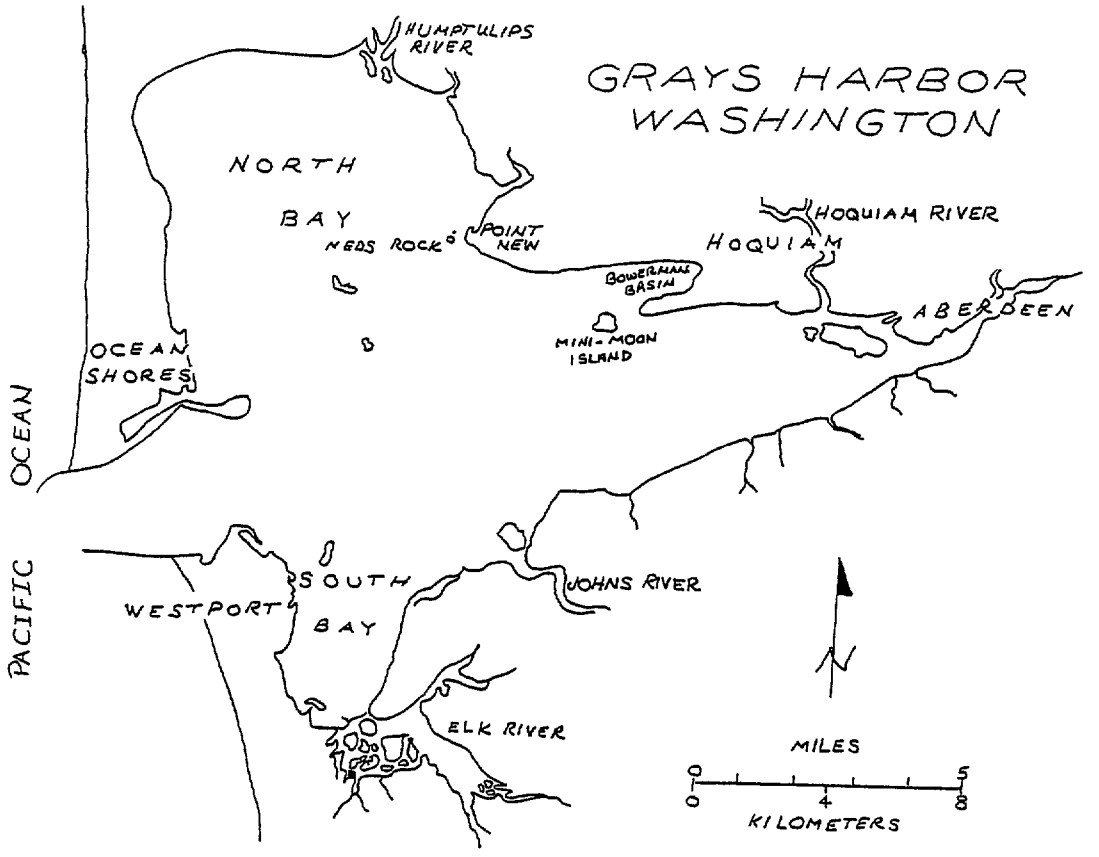


Figure 1. Grays Harbor, Washington

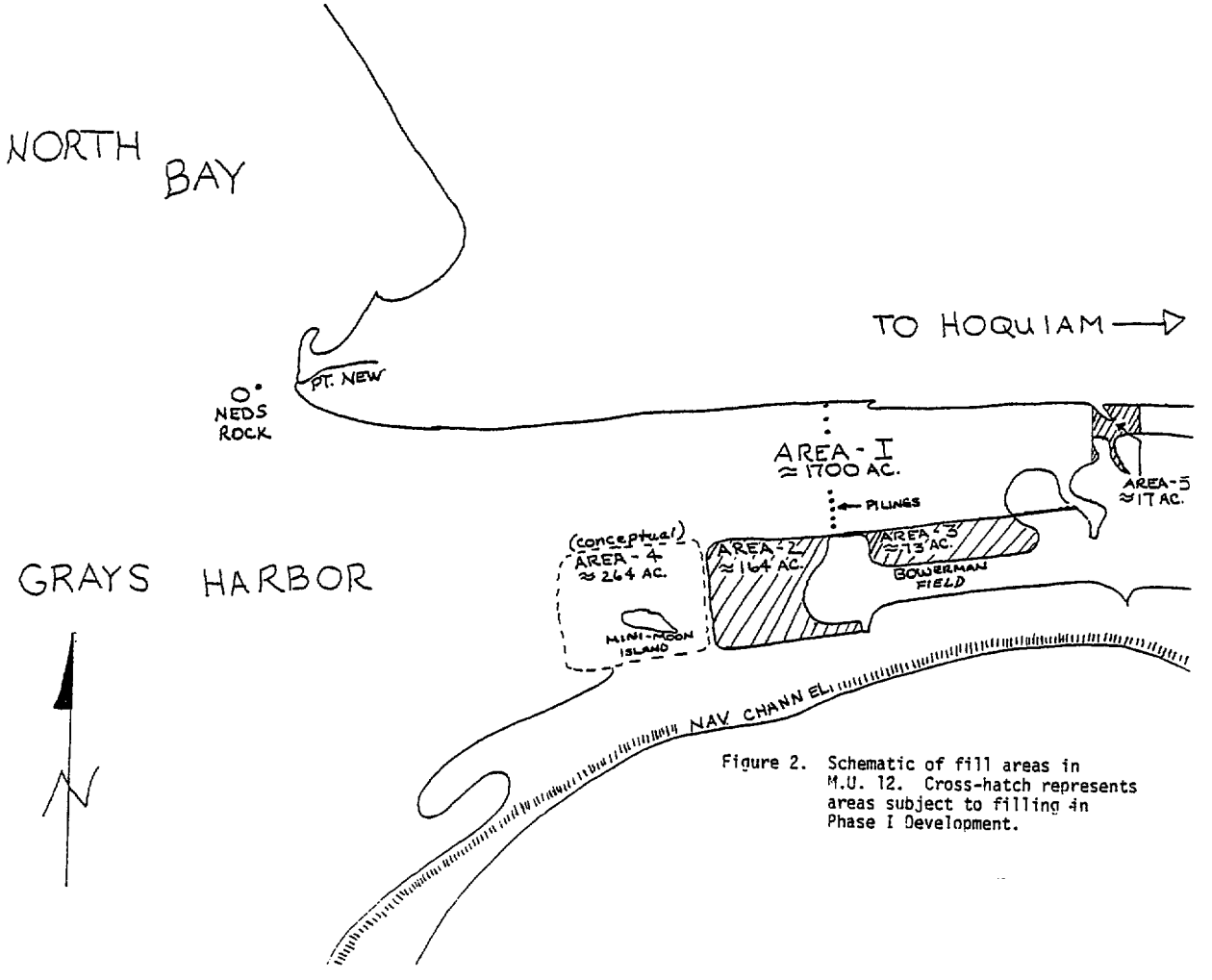


Figure 2. Schematic of fill areas in M.U. 12. Cross-hatch represents areas subject to filling in Phase I Development.

c. This uncertainty led to the plan's provisions for phased filling and the need to conduct a monitoring program prior to making any decision on Area 3. Phase I filling (Area 2) could take up to 10 years or longer to fill and airport relocation is a long-term (i.e., possibly 15 years or more away) proposal. Likewise, the potential impacts associated with Area 4 fill would have to be evaluated in the future based upon future circumstances and impacts associated with Area 2 and Area 3 fills. On March 3, 1983, OCRM staff met with Drs. J.P. Myers, (Academy of Natural Sciences of Philadelphia), S.E. Senner (Hawk Mountain Sanctuary Association) and M.A. Howe (U.S.F&WS) to discuss the GHEMP proposal and to solicit information on the possible impacts of GHEMP implementation to the large populations of shorebirds during migration and the winter months. Concern was expressed about the effects of any additional filling in the Bowerman Basin. However, if a decision was made to fill Area 2, a monitoring program should be in place before any filling was begun. The following procedures were recommended to be used as baseline and for possible follow-up studies.

(1). Census. Conduct censuses of shorebirds in Bowerman Basin and surrounding portions of Grays Harbor at regular intervals throughout the year, with effort intensified during the period of migration (especially spring). Census methodology must be consistent and replicable, but actual methods could be determined at a later time.

(2). Color-Marking. An intensive color-marking study should be initiated in order to determine both normal patterns of movement of individuals within the estuary and rates of turnover of birds during migration. These studies will help answer the question of site fidelity of individuals and permit more accurate estimates of total numbers of birds using the area during migration.

(3). Body Condition. Changes in Bowerman Basin may affect shorebird food supply or intensify competition between individuals. This may result in deteriorating body condition or attenuated rates of pre-migratory fat deposition. Birds trapped for marking should be weighed and examined for molt or other indicators of health.

(4). Invertebrates. The invertebrate prey population should be systematically sampled throughout the year, not only to determine distribution and numeric abundance, but also to determine size distributions and caloric content. This should be done in both natural and reclaimed areas.

(5). Use of Reclaimed Areas. Shorebird use of reclaimed areas after the development has been initiated should be carefully monitored.

They stressed the importance that the work be started as soon as possible if the plan is approved, so that baseline patterns and natural levels of variability can be established. This would allow for a more quantitative assessment of impact.

2. OCRM Assessment

a. OCRM concurs in the assessment of impacts made by the F&WS for American peregrine falcon habitat protection in MU 12 based on their December 11, 1981 opinion. That assessment is based on the protection and enhancement

provisions to the falcon's habitat and prey base, the shorebirds. OCRM offers these additional thoughts on potential impacts to shorebirds. There is a likelihood for some adverse impacts to occur which will be associated with the discharge of dredged or fill material in MU 12 and subsequently with land use activities permitted under the plan. Those impacts could be significant or non-significant depending on a number of variables (i.e., there is uncertainty as to the degree of severity of impact on the populations of shorebirds). Adverse impacts could result from a direct loss of some of the bird habitat and possibly due to added stress (i.e., in addition to being hunted by predatory hawks and falcons, adverse weather conditions, normal competition for food and space) placed on the shorebirds through noise, light and perhaps water quality.

(1). The worst case scenario would result if all shorebird utilization of the Bowerman Basin were to cease as a result of land use activities in Areas 2, 3 and 7, even though a majority of the now existing prime feeding and roosting habitat will be preserved and/or reestablished under mitigation and enhancement. The most severe impacts should they occur would be to wintering populations of dunlins and migrant populations of western sandpipers which tend to favor the area in large numbers. Impacts might occur as a result of some unacceptable level of stress to the birds in which they avoid the area, not as a result of direct mortality from construction because of the birds mobility to avoid such impacts. The impacts may be short-term or long-term. Mortality among shorebirds can be attributed to a number of factors including inclement weather conditions on the breeding grounds or during the winter months, lack of food, pesticides, diseases, predation, and not having enough body fat when the birds arrive at the breeding grounds which may lead to lower reproductive success (Senner, personal communication). The latter would affect future population growth rather than result in direct mortality.

(a). Figure C-9 shows four hypothetical time-related impact response patterns to organisms disturbed by construction in wetland ecosystems. Since GHEMP contemplates phased filling and activities occuring over a long-term period (10-15 years), pattern C (Delayed Response), may best represent potential impacts under a worst case scenario in which the birds are inhibited from further utilization of the remaining habitat. Naturally, the response pattern is highly simplified since it represents a view of a stable population base which in essence does not exist. If bird response is less severe and the birds continue to use the Bowerman Basin but to a lesser extent because the total carrying capacity has been diminished, then pattern D (Substitution), line (a) is the best representation of potential impacts.

(b). Table C-7 shows generalized biological response patterns to increased levels of environmental stress to individuals, populations, species or communities. Increased stress will tend to force greater competition of the best remaining resources and force the more sensitive or less tolerant individual birds to utilize less desirable habitat thereby creating certain behavioral and physiological debilitating effects such as reducing resistence to disease, predation or causing mortality during cold winters. The chief concern regarding destruction of habitat is whether the habitat is unique and whether the wildlife using it can be absorbed into alternate habitat. In light of the fact that Grays Harbor is the northern-most large protected bay on the Pacific coast south of Alaska, an action undertaken which would reduce the capacity of Grays Harbor to offer a resting and feeding place for migrating or overwintering birds would be considered a negative effect. While no absolute

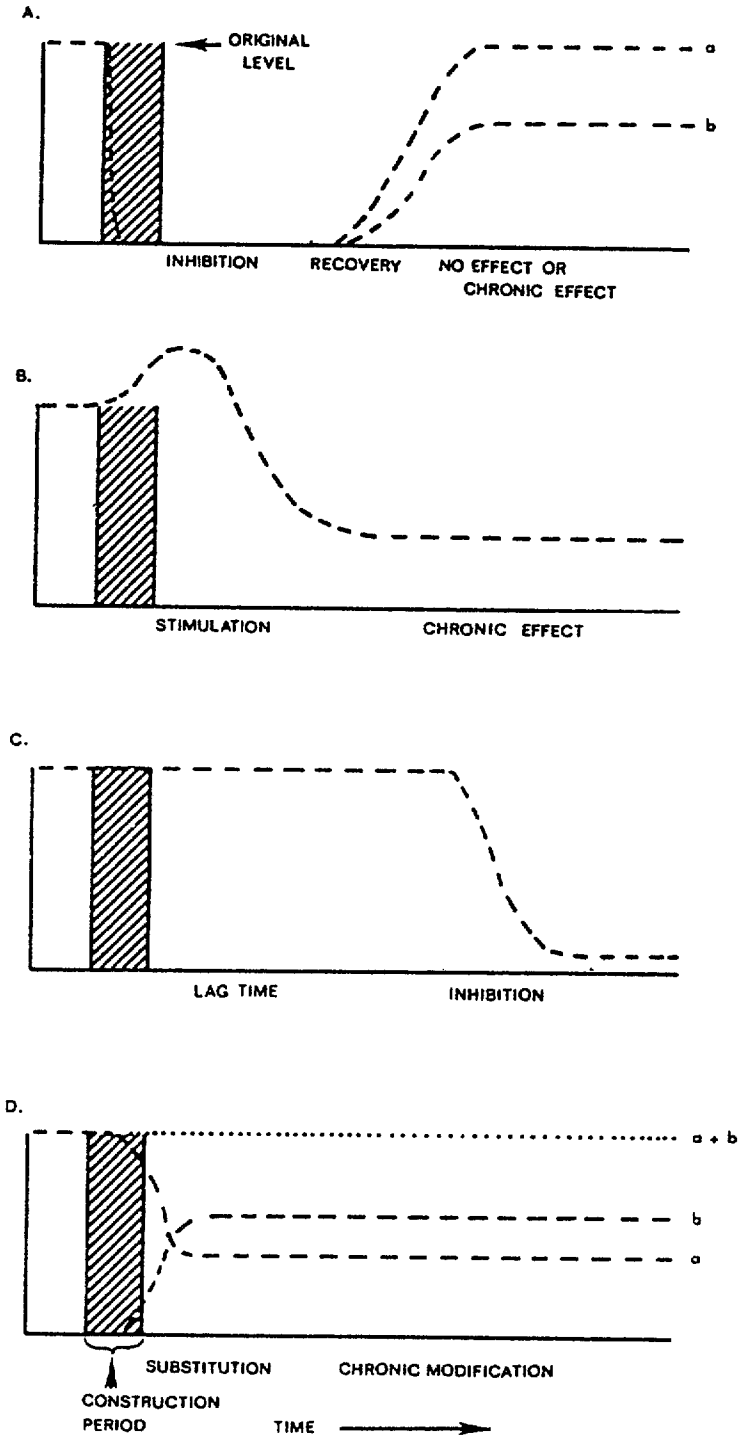


Figure C-9. Time-related patterns of wetland ecosystem response to construction disturbance. A. Elimination followed by complete (a) or partial (b) recovery. B. Stimulation followed by depression. C. Delayed response. D. Substitution response.

Source: Darnell 1976 (EPA-600/3-76-045)

TABLE C-7. Generalized biological response patterns to increased levels of environmental stress. Response is given for several different levels of biological organization. Entries within a given vertical column are meant to indicate trends of response pattern. Habitat elimination sends all columns to the bottom entry.

Degree of Stress	Response at indicated level of organization			
	Individual organism	Population	Species	Community
Moderate	-Some metabolic and behavioral interference. -Reduced competitive ability. -Reduced resistance to parasites and predators. -Reduced capacity for reproduction.	-Reduced competitive ability of most sensitive individuals. -Some genetic selection for more tolerant individuals.	-Most sensitive populations undergoing selection for hardiest individuals, hence losing genetic diversity. -Most tolerant populations little affected.	-Noticeable shifts in relative species abundance as the most sensitive species suffer reduction in numbers while more tolerant competitor species remain the same or increase in abundance.
Heavy	-Individual under heavy stress load. -Survival not in jeopardy, but individual weakened and susceptible to parasites, disease, and predation. -Reproduction greatly curtailed.	-Elimination of most sensitive individuals. -Increase in more tolerant individuals. -Population level may or may not be affected. -Reduction in genetic diversity.	-Most sensitive populations eliminated. -Most tolerant populations losing sensitive individuals, hence losing genetic diversity.	-Significant shifts in species composition as sensitive species are eliminated and hardy competitors remain and often increase. -New hardy species may enter from elsewhere.
Severe	-Severe metabolic and behavioral interference. -Individual survival in question. -Reproduction no longer possible.	-Survival of only the most tolerant individuals. -Population level may or may not be reduced. -Severe reduction in genetic diversity.	-Only the hardiest individuals of the most tolerant populations still survive.	-Great shifts in species composition. -Most species reduced or eliminated. -Hardy species may become very abundant. -Total system greatly simplified. -Community metabolism greatly modified. -Stability severely reduced.
Total	Death	Elimination	Extinction	Collapse

Source: Darnell 1976 (EPA-600/3-76-045)

prediction on the numbers of birds which may be adversely impacted can be made with any degree of assurance, the following findings of Goss-Custard (1979) which are based upon research conducted in England estuaries on the effect of habitat loss on the numbers of overwintering shorebirds suggest that filling of Area's 2 and 3 may lead to a decrease in the numbers of shorebirds, but only to the extent that there is a food shortage which is already contributing to winter mortality. Goss-Custard found that:

> Shorebirds are not spread out evenly over intertidal flats. Some are used more than others and may be considered as preferred feeding grounds for possibly a number of reasons (i.e., close to roosting site, high densities of prey organisms). If a large part of the feeding habitat is lost, some birds may go to other sites which may be non-preferred sites or if they stay will increase the density and the competition for a smaller prey base. Observations imply that there is a limit to the number of birds that can exploit any preferred feeding areas that remain after a development has taken place and indicate that more feeding would be done, presumably by subdominant individuals, in the less suitable areas. A reduction in feeding area might result in birds leaving the estuary altogether. However, an increase in density levels might occur in preferred areas because a clear ceiling density is not reached, and an increase in competition for space might force birds to tolerate higher densities. An increase in bird densities may not affect survival unless birds already have difficulty in obtaining food requirements at some time between August and May. The abundance of available food for some shorebirds may decline during the winter suggesting that food may be relatively difficult to collect at that time of the year. The decline may be due to loss of body weight, less accessible (buried deeper in the mud), etc. Younger individuals being less experienced and subdominant to adults may be the ones most likely to be forced into the less profitable feeding areas and may be the ones most at risk.

Goss-Custards studies indicate that the most critical time for shorebirds may be during the winter months during times of prolonged inclement weather if and when a food shortage exists. (Goss-Custard's work does not address the effects of habitat loss on migrants, only overwintering birds.)

There is no current evidence to support the prospect that a worst case scenario will occur in the future based upon the previous actions taken in and around the Basin. Many hundreds of acres have been filled to the east of the Basin and while the birds have been denied those acres from further utilization, they continue to use the Basin in large numbers. Likewise, the fact that large numbers of birds continue to use the Basin in numbers is no evidence against the possibility of the worst case scenario occuring. What may be occuring here is a situation in which incremental losses are tolerated up to a certain threshold. Without knowing historic use levels, it is hard to say whether present use represents a healthy situation.

(2). In addition to habitat loss, a second negative impact associated with filling and dredged material disposal is potential degradation of water quality. A confined disposal site for material dredged from the water, and by overflow of the dredged material over the confining dike. Overflow of the dredged material may occur as a result of dike failure which

seldom happens in the Seattle District of the Corps of Engineers. When dike failures occur, a slurry of dredged material, turbid water, and possible harmful pollutants enters the surrounding environment. If the slurry enters a water body, several ecological impacts may occur:

o the material could spread out in a fan covering benthic materials or interfere with filter-feeding organisms; or

o toxic pollutants could enter the surrounding ecosystem and be taken up through the food chain.

Likewise, seepage through the dike may release soluble pollutants. The dredged material to be disposed in Area 2 would most kikely be form the navigation channel as part of the widening and deepening project or by maintenance dredge disposal until the area is flled. The navigation channel does contain pollutants and has recently been analyzed by the Corps of Engineers for the proposed widening and deepening project. The majority of the polluted sediments would be disposed of in Port Slip #1. However, if polluted material were disposed in Area 2 (164) acres), it is unlikely that a water quality problem will exist even if there is a dike failure given the dilutiion factor relating to the area in which the disposal would be confined (Seattle Corps of Engineers, personal communication, 1983).

(3). There is also a possibility in which there will be no significant adverse impacts. Some of the reasons which may account for this include:

(a). Area 2 would be filled first allowing the birds time to adjust to the modified environment. Area 2, while not an insignificant shorebird feeding and roosting site is apparently of lesser significance than other sites in MU 12. There is evidence of the ability of shorebirds to adjust to new environments and utilize new feeding grounds (Fry 1981).

(b). The peninsula would be extended creating additional protection from wave action and severe storms.

(c). Additional roosting habitat would be created along the west and north borders of Area 2 providing a greater mosaic of habitat (including marsh habitat), albeit at the expense of some intertidal feeding habitat.

(d). The land use activities in Area 2 may not prove to be severe enough to place stress on the birds. There will be buffer vegetation provided which will shelter the birds from intense human activities most of which would occur near the navigation channel and loading docks. Train movement around the perimiter may not be especially adverse as train activities are or have been common on both sides of the estuary for many years. However, the intensity of train movement and noise will depend on many factors which cannot be fully evaluated at this time. Likewise, if after Area 2 has been filled and a determination of non-significant impact is made with respect to impacts on shorebirds and falcons and Area 3 is filled, the land use will consist only of relocation of the airport runway north of the existing field.

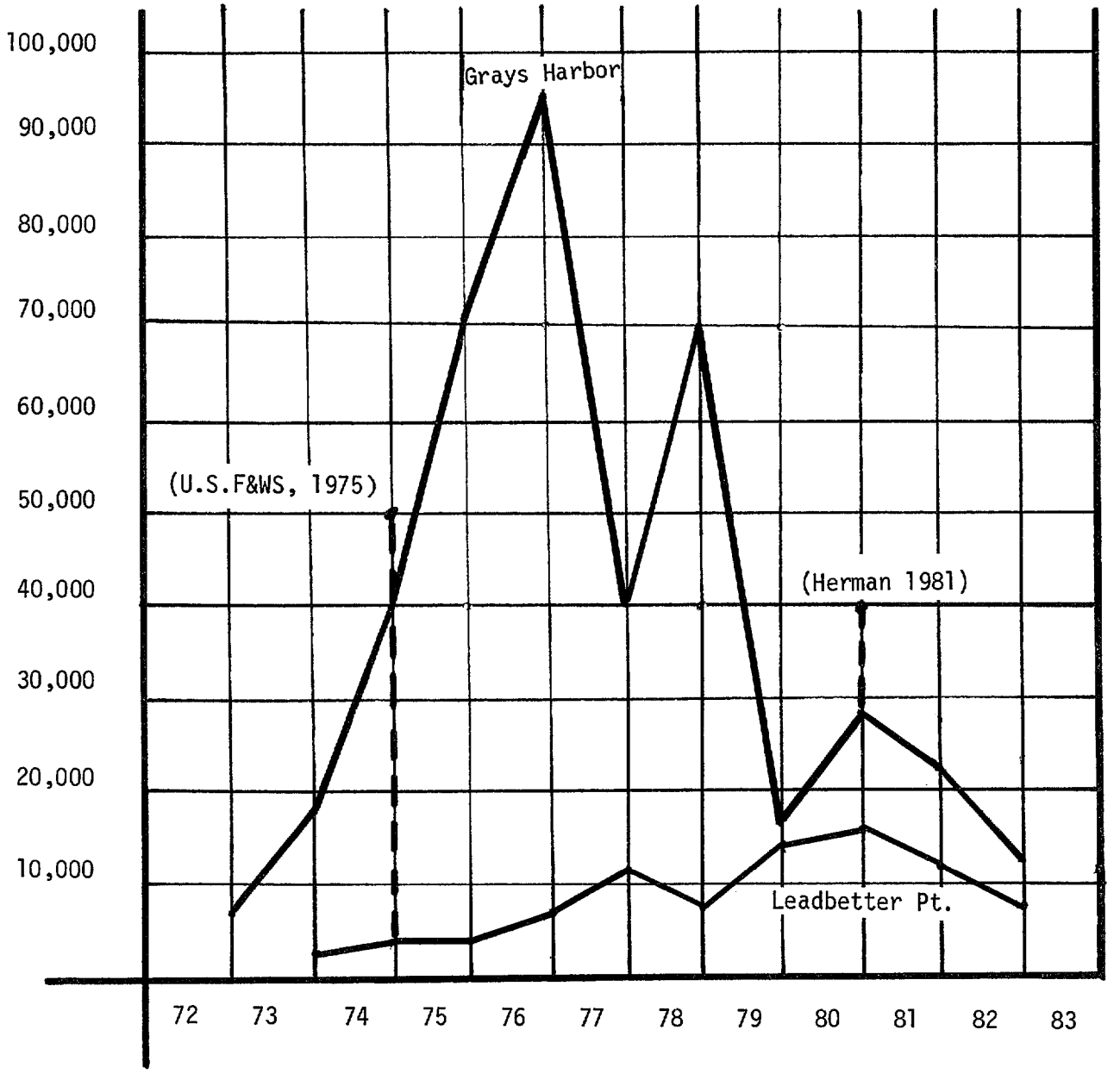
The existing Bowerman Airfield has apparently not adversely impacted the shorebirds for approximately 40 years. The birds are known to use the airfield for roosting. While birds take to flight now and then upon approaching aircraft, they have continuously utilized the Basin over these many years.

(4). The severity of adverse impacts cannot be quantitatively or even qualitatively identified at this time as was pointed out in the F&WS opinion. This is the reason there is a need to monitor activities and make further assessments in the future during the various phases of activities. There are a number of reasons an accurate assessment of the full impacts associated with MU 12 implementation cannot be made.

(a). Bird populations are highly variable from day to day, month to month, season to season and year to year and estimating impacts related to a single variable (e.g., Area 2 fill) versus population fluctuations is extremely difficult if not impossible, particularly for migratory birds. Assessment may require many years of monitoring prior to being able to make an estimate of impacts, especially since so much of the important habitat is being protected. Figure C-10 shows the only long-term data which exists regarding bird counts made during the annual Audubon Christmas Bird count for Grays Harbor. These yearly counts were made around the middle of December over the last 10 years by approximately 40 individuals who covered the whole estuary and adjacent uplands. Wintering populations of dunlin varied from 7,965 in 1972 to 95,000 in 1976. During two years (1977, 1979) there were drops in the population of 55,000 birds. As far as is known, no evaluation has been undertaken of this wide fluction of populations of dunlins in Grays Harbor. Leadbetter Point, in Willapa Bay is shown by comparison. It shows a steadier population level. However, Leadbetter Point is only one part of Willapa Bay. During the winter of 1974 when the Audubon count for Leadbetter Point was approximately 4,000 birds, the U.S.F&WS made a count of 50,000 dunlins for the entire estuary. That same year the count for Grays Harbor was 40,000 dunlin. In 1980, the Audubon bird count was 28,000 dunlin and Dr. Steven G. Herman estimated 40,000 dunlin present in the harbor (Herman and Bulger 1981). All this points out the extreme variability of bird populations due perhaps to census taking, timing, environmental conditions, breeding success, and other factors which may or may not be related to habitat destruction. Therefore, counts which may differ by several thousands on a monthly or yearly basis because of many different potential reasons make impact assessment even more difficult.

(b). Length of feeding time. Herman and Bulger (1981) and Anderson (1980) point out that one of the reasons the Bowerman Basin is important is because it provides the shorebirds with a longer feeding time (1-2 hours) as the tide ebbs and flows. There is a question if the one to two hours is of major significance to the shorebirds and their survival or preparation for flight up to Alaska. Future studies would have to be conducted to determine if the birds which utilize Bowerman Basin have greater increases in body weight during their winter stay or for the short stopover time they stay during migration as a result of this extra feeding time. Fifty to sixty percent of the shorebirds which utilize the estuary apparently do not have or take advantage of this extra feeding time. To date, there is no indication that they do not survive the trip to Alaska or are any better or worse off than the birds using Bowerman Basin; or that there is a greater mortality rate during "harsh" winters for birds which utilize the other feeding and roosting

FIGURE C-10.
DUNLIN WINTER POPULATION COUNTS
GRAYS HARBOR and LEADBETTER PT., WILLAPA BAY



SOURCE: AMERICAN BIRDS, Audubon Chrismas Bird Counts.

sites. If this extra feeding time does provide some advantage to the birds, then Area 2 fill is the least environmentally damaging alternative in MU 12 (other than no fill) since it does not provide the birds with the extra feeding time like the Basin does. Likewise, Area 3 fill would cause greater adverse impacts.

(c). Related to the length of feeding time is the still unanswered question of the difficulty of the migratory flight from Grays Harbor to Alaska. Some bird experts believe that the approximately 1,000 mile (1,600 kilometer) flight from Grays Harbor to Alaska during spring migration is extremely demanding and requires the birds to replenish fat reserves in order to make the arduous flight. Hence, the importance of the Grays Harbor estuary as the last major stopover south of Alaska. This assumes that the two to five day stopover time is sufficient to replenish fat reserves and that there would be a gain in weight during this time. This is one of the items which should receive further study in the coming years. It also assumes that the birds do not make additional stopovers in other locations to feed and rest. Senner (1981) reports that the estimated flight range capabilities for western sandpipers in the Copper-Bearing River Deltas system is about half the mean estimated range of dunlins $600^{+}77$ km (R = 177 - 1081 km) compared to $1260^{+}89$ km (R = 744 - 1791 km). These are distances that could not propel the birds Washington to Alaska on a non-stop flight. These figures are based upon body weight and fat reserves and the flight ranges are scientifically estimated. At the same time, Senner and Martinez (1982) have also found that the potential flight ranges of migrant western sandpipers in spring have been found in excess of 2,000 km which is enough to allow the birds to make the non-stop flight. So there is a great deal of variability in the capabilities of the birds which makes it difficult to come to any definitive conclusions. Based upon his work in Alaska, Senner hypothesized that dunlins tended to migrate by extended, non-stop flights, while western sandpipers tended to stop more frequently (i.e., a series of relatively short "hops") between the Copper-Bering River Delta systems and the western Alaskan breeding grounds (a distance of 600-700 miles (1,000 km). Senner, et. al., (1981) points out that there is no direct basis for evaluating the extent to which either species makes non-stop flights from Washington and southern British Columbia to Alaska without conducting extensive survey work along the intervening coast.

Another point of view is provided by Kaiser (1981). In concluding from observations and studies on the western sandpiper conducted in the Fraser River Delta of British Columbia, Kaiser states that "although the migrations cover long distances and adhere to a specific schedule, neither the northward nor the southward movements seemed to be particularly rigorous" and "because the birds forego a large build-up of weight which might be associated with an arduous overwater flight, they may undertake a more gradual migration using the many small estuaries and beaches that dot the British Columbia coast. I have observed western and other Calidris sandpipers on the sandy beaches of McIntyre Bay on the Queen Charlotte Islands and on the gravel bars in Big Bay just west of Prince Rupert during both spring and fall migration. Neither area contains any typical mudflat communities but they are used by thousands of shorebirds in the absence of more preferred habitats."

Thus, it may be, for western sandpipers at least, that Grays Harbor is not the last stopover for at least some portion of the population prior to arriving at the Copper-Bering River Delta system. Senner (1979) found that the mean body

weights of western sandpiers did not change during the feeding and resting period in the Delta system prior to flying to other intermediary stops before arriving at the breeding grounds. Senner concludes that the fact that their mean body weights do not change across the C-BDR system does not diminish the value of the system as a habitat in which individual birds can replenish fat reserves needed for migration and reproduction.

(d). There are several unanswered questions with respect to the carrying capacity of the Grays Harbor estuary. Given the variability of the bird populations and also the different densities and utilization rates of the various sites within the estuary, it is difficult to predict what the carrying capacity of a feeding area may be. If birds are forced because of competition (spatial or feeding) to other sites, there is no knowledge that other sites within the harbor like Wakina Flats, etc., are less desirable or do not have the capacity during any particular point in time to feed additional birds. During the 1981 spring migration, Bowerman Basin use varied from a number of 400,000 on April 23 to 6,700 on May 13 and Bottle Beach from 130,000 on April 25 to 900 on May 13. Populations fluctuated daily and birds moved from one area to another. Herman and Bulger (1981) reported movement of shorebirds as a temporal shift in migration from the South Bay to the North Bay area before and after April 27 and believed the shift was indicative of a migrational shift as the shorebirds moved in the direction of their northern nesting grounds. This would be opposed to a belief that the carrying capacity of South Bay had diminished to such an extent that it could no longer support vast numbers of birds, although such a possibility can not be ruled out. With respect to dunlins and western sandpipers use of the estuary, there is no clear cut indication that other areas in the harbor are less productive or are not capable of supporting larger populations if some of the birds are displaced, with the possible exception of the inner harbor area. It may never be known to what extent the birds are concentrating on less "optimal" tideflats and roosting sites than previously and whether or not this has resulted in a decrease in the population of the species. The historical loss of 3,800 acres of tideflats is likely to have had some negative effects on the shorebird populations over time, although all tideflats may not have historically been used to the same degree as the Bowerman Basin. It is not possible to estimate the mortality factor related to the loss of this habitat over the many years because empirical data and studies are lacking. Herman and Bulger (1981) state that there is no way now to estimate the long term impact of the intertidal habitat destruction that has taken place in the Grays Harbor estuary historically. Also, there are no records of major winter kills of dunlins in Grays Harbor which can be related to a lack of adequate food. The weather is relatively mild and the estuary doesn't ice over and deny the birds important tideflat feeding grounds.

(5). Opinions of shorebird experts.

(a). OCRM has received directly or has been provided copies of a number of letters from shorebird experts who have stated their opinion of the importance of the Bowerman Basin to species of wintering and migratory shorebirds, especially dunlins and western sandpipers. The list of individuals include:

o Dennis R. Paulson	Burke Museum, University of Washington
o Steven G. Herman	Professor, Evergreen State College
o Stanley E. Senner	Hawk Mountain Sanctuary Association
o Edward H. Miller*	Vertebrate Zoology Division, British Columbia Museum
o Raymond McNeil*	University of Montreal, Center for Ecological Research
o Gary Page*	Point Reyes Bird Observatory
o Joseph R. Jehl, Jr.*	Hubbs-Sea World Research Institute
o J. P. Myers*	The Academy of Natural Sciences of Philadelphia
o Frank A. Pitelka*	Professor, University of California, Berkely
o Brian A. Harrington*	Manomet Bird Observatory
o Jack Davis	Black Hills Audubon Society

* These individuals wrote letters of concern to Dr. Dennis R. Paulson and were provided to OCRM through Mr. David Ortman, Friends of the Earth. Their viewpoints are appreciated and their comments on the PDEIS are encouraged. With Dr. Paulson's permission, copies of their letters are included for the record as an addendum to attachment C.

(b). Summarizing their concerns, they are opposed to any fill and industrial development in the Bowerman Basin and believe that Grays Harbor as a whole, but especially the Bowerman Basin is a "critical" stopover location for migratory shorebirds along the Pacific Flyway and that the environmental health of Grays Harbor is therefore a matter of international importance. They believe that any fill and subsequent industrial land use activities will have immediate as well as long-term detrimental effects for both wintering populations and spring and fall migrants. The result will be reduced shorebird populations because of mortalities or diminished reproductive success because they believe:

o there is a lack of alternative feeding and resting sites;

o many species return to the same sites each year (site fidelity) and if the habitat is no longer useable, they are incapable of finding new sites and will therefore be unable to replenish fat resources in order to make the "exhausting" flight to Alaska stopover grounds on their way to the breeding grounds;

o the impacts of displacement of the Bowerman Basin will affect the shorebird populations throughout the entire estuarine system (i.e., have a domino affect).

(c). OCRM concurs in the assessment of significance of the Bowerman Basin as being an important habitat for many varieties of birds. It's significance lies mainly in the fact that the Basin apparently provides conditions conducive to providing the birds with preferred feeding and roosting habitat and that the birds utilize the area in large, concentrated numbers. Part of the factors which make the basin a preferred habitat may include physical features which have in part been created through previous dredged disposal and fill activities. It has not been shown to date that there are unique biological features (e.g., the highest density or diversity of prey species like Corophium or other benthic invertebrates) in relation to other parts of the estuary which provide the most food for the least feeding effort per unit of time. This information can most likely be confirmed with subsequent, focused studies. With the GHEMP, the majority of the Bowerman Basin will be preserved in perpetuity for the shorebirds. It is not clear that alternative feeding sites to Area 2 do not exist within the estuary and would not be used by the shorebirds. Implementation of the provisions of MU 12 does have the potential of increasing roosting habitat. Further studies need to be conducted to determine how much the birds increase in body weight (increase fat reserves) during the short stay in Grays Harbor during migration and if the fat reserves are a limiting factor in the birds ability to make a 1,000 mile non-stop flight to Alaska. Future research and observations will provide better answers to these and other questions.

3. Conclusions

a. Mitigation and enhancement measures built into the GHEMP and the F&WS opinion include protecting a majority of the existing prime habitat for the shorebirds which favor the Bowerman Basin. At least 400 acres (out of 500) of the Bowerman Basin will be permanently protected with no future threat of filling activities. Some negative impacts should be expected whenever feeding habitat is lost. Area 3 fill would likely produce the most significant impacts as that area serves most as a late feeding and prime roosting site. It is OCRM's opinion that the impacts will not lead to either heavy mortality factors among the shorebird populations that utilize Area's 2 and 3 or the rest of the estuary based upon the loss of habitat. There is a potential for Bowerman Basin to be utilized even more intensively in the future and that peak migrations may show even greater concentrations of birds until a carrying capacity (during a particularly prolific year) is reached which may differ from year to year. There are several indications and studies which show that the shorebirds are able to adjust to new conditions and surroundings. There have been no reports (historical of recent) which have confirmed major incidences of mortality of shorebirds in Grays Harbor or in the Copper-Bering River Delta systems which may be the next stopover point in the birds migratory route to the western Alaskan breeding grounds. What we are dealing with is uncertainty. In the face of uncertainty and based solely upon the interests of the bird population, caution suggests that there be no additional filling in or near the Bowerman Basin. However, based upon the philosophy which the Task Force has initiated in which they attempted to balance the economic development interests with the preservation interests, the current plan shows a clear attempt by the Task Force at being prudent managers of the resources and seeking a balance and management strategy in MU 12 which attempts to provide some foresight into a difficult management decision. Additional assessments will be required in the future to provide further information on which to base final decisions on particular permit applications.

ADDENDUM TO APPENDIX C:

LETTERS FROM SHOREBIRD EXPERTS IN RESPONSE TO

DECEMBER 22, 1982 LETTER WRITTEN BY DR. DENNIS R. PAULSON

THOMAS BURKE MEMORIAL WASHINGTON STATE MUSEUM

UNIVERSITY OF WASHINGTON

SEATTLE, WASHINGTON 98195

22 December 1982

We are in danger of losing one of the most important shorebird habitats on the Pacific coast, and I would like to ask your help in saving it.

Grays Harbor, Washington, furnishes habitat for migrating shorebirds of many species. Of particular importance is Bowerman Basin, a shallow basin of several hundred acres adjacent to Hoquiam. Spring migrant shorebirds use this protected mini-estuary as a staging ground, peaking in the last week of April when hundreds of thousands of birds are present simultaneously (one estimate of 400,000). The basin furnishes low-tide feeding and roosting, high-tide roosting and the most exposed flats available for feeding just before and just after high tides. Bowerman Basin is extremely important at that time, and, in addition, it supports flocks of tens of thousands of shorebirds through fall migration. Western Sandpipers, Dunlins and Short-billed Dowitchers are the abundant species, the Dunlin also wintering in the tens of thousands (almost 100,000 in one peak year).

Developers and planners in the Grays Harbor Estuary Planning Task Force are trying their utmost to clear the way for the filling of Bowerman Basin or parts thereof for marine-related industries, because it is shallow and convenient to Hoquiam. Local environmentalists and biologists, including Steven G. Herman and myself, have apparently halted the original plan to fill the entire basin, primarily because Peregrine Falcons use the area. Recent modifications of the plan include the filling of as much as one-third of the basin, and the proposed fill sites encompass some of the most valuable feeding and roosting area now used by the birds. No matter how we have tried, we have not entirely convinced all interested parties of the value of this site, certainly the biggest concentration of shorebirds on the west coast south of the Copper River delta. This has been documented by Herman and John Bulger in a report to the U. S. Army Corps of Engineers in September 1981.

We think that with a bit more professional input our statements about these matters will gain more credibility. Could you possibly write a letter to me about the international importance of Grays Harbor and, especially, Bowerman Basin? This of course would be based on your professional expertise as a shorebird biologist, and a sentence or two making that expertise clear would be a valuable part of the letter.

I hope you will find time in what I know is a busy schedule to write at least a brief letter. David Ortman, of Friends of the Earth in Seattle, has been the most active environmentalist in this process, and he will probably follow up on this by phoning you after the first of the year, as there is a sense of urgency. The Task Force is attempting to wind up its deliberations, and an E.I.S. is being written at this time that could include your comments. My phone number is 206-543-4486 if you have any questions that I might answer; David's is 206-633-1661. Thank you very much for anything you can contribute.

Sincerely yours,

Dennis R. Paulson
Acting Curator of Zoology

HUBBS-SEA WORLD RESEARCH INSTITUTE
1700 South Shores Road, Mission Bay, San Diego, California 92109 (714) 223-2693

4 January 1983

Dr. Dennis R. Paulson
Burke Memorial Washington State Museum
University of Washington
Seattle, WA 98185

Dear Dennis:

Thank you for alerting me to the status of the Bowerman Basin. That is not good news.

As you know, I have been studying shorebirds and their migrations for over 25 years and have published rather extensively about this group of birds. Accordingly, I feel qualified to at least make some general comments on your situation, even though I have no direct knowledge of the area.

We have known for a long time that many species of shorebirds make very long non-stop migrations; some cover only a few hundred miles at a flight, but others may fly as much as 3,000 miles nonstop. Such flights, of course, are very taxing energetically, and many birds arrive at their destination totally exhausted, with their fat reserves fully depleted, and are unable to proceed farther without a rest stop of 10-14 days.

We have also been able to establish that many species return each year to the same traditional staging areas. If, for some reason, these areas disappear, or if ecological conditions change such that the area can no longer support the numbers of birds that rely on them, the consequences could be serious. Indeed, entire populations of species could be affected, perhaps even to the extent that they would require (or demand) special protected status (i.e., endangered, threatened) from governmental agencies.

These staging areas, then, are really "critical habitat" for many species, and they should not be tampered with unless one is absolutely sure that alternate sites are available.

All of the information available to me indicates that the Bowerman Basin is an extremely important staging area for many species of shorebirds, both in spring and fall. Furthermore, I know of no alternate sites that can take its place, should it become degraded or changed.

All of the species that stage at Bowerman Basin are long-distance migrants, which move from Alaska to Central or South America. Many breed in the Canadian arctic. Thus, we are dealing with an area that has international importance. Harmful actions in Washington can imperil the resources that belong, equally, to other nations. The Migratory Bird Treaty protects these animals from being killed directly. Should it not be extended to prevent the indirect death as a result of destruction of the habitat on which they rely.

I urge you to continue your efforts to sensitize local authorities to the value of this area, and I would further urge you to bring this matter to the attention of the National Audubon Society or other environmental groups, so that all the relevant information can be fully discussed and evaluated prior to the making of an irreversible decision.

Sincerely yours,

Joseph R. Jehl, Jr.
Assistant Director

JRJ/eg

Province of
British Columbia

Ministry of
Provincial Secretary
and Government Services
PROVINCIAL SECRETARY

British Columbia
Provincial Museum
Parliament Buildings
Victoria
British Columbia
V8V 1X4

5 January 1983

Dr. D. R. Paulson
Burke Museum
University of Washington
Seattle WA 98195
U.S.A.

Dear Dennis:

I remain horrified at the prospect of Bowerman Basin being reduced in extent by filling, for "development." The basin is truly extraordinary in its value to shorebirds passing north to breeding grounds in Alaska, the Yukon, and northern British Columbia, at the very least. It is also enormously important to certain species during winter and in fall migration. The simple statistics of use of the area by species and numbers attest to its significance, but conceal a very complex web of cause and effect. For example, there is simply nowhere else for the vast majority of the shorebirds to go; they can not just shift to another location, partly because none exists, and partly because they are highly conservative animals. Available evidence from South America, Europe, Africa and both coasts of North America indicates that shorebirds are strongly site-faithful from year to year, both to their wintering areas and to their migration stopover points. Further, the evolutionary "choice" of the Bowerman Basin (and other parts of Grays Harbor) as a stopover point in spring (for example) was based on its richness and its proximity to the nesting grounds: it is crucial for these birds to "fuel up" before making their flight north to breed, as is well known from studies on energetics and fat deposition. Finally, evidence being compiled over the past decade points to wintering areas and migration stopover areas as the most important parts of shorebirds' life cycle, as far as their population regulation is concerned. We can get away with far greater disturbance on their breeding areas than we can elsewhere, without materially impairing the health of shorebird populations.

As you know, my shorebird research over the past nine years has covered breeding areas from Nova Scotia to the north coast of Alaska. In the past few years, I have been working in Alaska, the Yukon, and northern British Columbia. It is no exaggeration to predict that significantly large areas there would become impoverished to nearly depleted of certain shorebird species if an act as major as the filling of Bowerman Basin were committed, and this is particularly true of species with modest to low nesting densities, like Short-billed Dowitchers. I strongly oppose such action on both scientific and environmental grounds.

Sincerely,

Ted.

Edward H. Miller
Curator
Vertebrate Zoology Division

EHM:nk

POINT REYES BIRD OBSERVATORY
4990 Shoreline Highway, Stinson Beach, California 94970
Telephone (415) 868-1221

January 11, 1983

Dear Dr. Paulson,

Your letter describing the threat to the habitat of hundreds of thousands of migratory shorebirds in the Bowerman Basin concerns me. Over the eleven years I have studied shorebird use of California wetlands I have discovered few areas that hold the large concentrations you describe. In fact in a recent conversation I had with Dr. Marshall Howe concerning the identity of locations with at least 20,000 shorebirds during migration, we only identified a handful of sites in California. A site that holds 100,000 is truly unusual! One wonders what these birds will do if they lose their habitat. What other feeding sites have been identified to absorb the refugees? Will this cause population declines that will show up as decresed numbers at California wintering sites? If the site is a staging area for long non-stop flights, say to breeding areas in Alaska, the problem may be even more serious.

Your efforts to oppose this particular development project are definitely worthwhile. I hope the decision-makers in Washington will agree to value this resource and you succeed in substantially scaling down the project.

Sincerely,

Gary Page

Gary Page

THE ACADEMY OF NATURAL SCIENCES

FOUNDED IN 1812
RESEARCH · MUSEUM · EDUCATIO

PHILADELPHIA

18 January 1983

Dr. Dennis Paulson
Burke Museum
DB-10
University of Washington
Seattle, Washington 98195

Dear Dr. Paulson:

Without doubt or exaggeration, Grays Harbor plays a crucial and irreplaceable role in the migration of hundreds of thousands of shorebirds on the Pacific Coast of the United States. If this area is altered substantially, we risk threatening a substantial and significant portion of the West Coast populations of many different bird species, species that now are common, populations that extend from the arctic to South America. This is because of the critical geographic location of Grays Harbor along the Pacific Coast and the habitat it affords migrating birds. The environmental health of Grays Harbor is thus a matter of international concern. Any reductions in the extent of intertidal habitat must be avoided, and alteration in the natural condition of Bowerman Basin would be especially damaging to international populations.

As a professional biologist who has worked on the population biology of migrating and wintering shorebirds along the Pacific Coast for the last 10 years, as a current board member of the International Council for Bird Preservation--Panamerican section, as Chairman of the Wader Study Group Steering Committee for North America, and as a member of the Neotropical Migrant Bird Advisory Council for the World Wildlife Fund-US, I am greatly distressed that Grays Harbor is now threatened by plans to fill Bowerman Basin. In my professional estimation this has significant potential for doing irreparable harm to the health of the Pacific Coast shorebird migration system.

Shorebirds such as Dunlin Calidris alpina, Western Sandpiper Calidris mauri, Short-billed Dowitcher Limnodromus griseus, Black-bellied Plover Pluvialis squatarola, and Semipalmated Plover Charadrius semipalmatus depend utterly on the resources they gather at staging areas during migration in order to complete their annual cycle. They fly into these sites in vast numbers, replenish their energy stores, then resume migration. Grays Harbor is one such site, and it is one of the most important along the Pacific Coast of the US. Work by Herman and Bulger in their report to the U.S. Army Corps of Engineers clearly documents this fact.

Traditionally Grays Harbor has been used by hundreds of thousand of shorebirds as they head northward to the breeding ground, and surveys indicate it is so important because of the extremely limited supply of suitable estuarine areas in the Pacific northwest. Thus the consequences of reducing a patch of intertidal habitat in Bowerman Basin extends far beyond the local area. It will materially affect the ability of hundreds of thousands of shorebirds to reach their breeding ground in breeding condition. We cannot risk the possible consequences of that effect.

There will be local consequences also. Based on my research in the central coast of California, in an estuary system not unlike Grays Harbor--but much smaller --we know that wintering populations (as opposed to migratory) depend upon a mosaic of habitats in order to survive through the winter. What happens in one part of that mosaic, for example, in Bowerman Basin, will affect shorebird populations throughout the entire estuarine system, in this example the Grays Harbor area. This is especially the case for key habitats within the estuary systems that are especially rich in food resources. As shown by Herman and Bulger's work, this is clearly the case for Bowerman Basin.

Over the last 100 years, intertidal habitats for shorebird populations along the Pacific Coast have been devastated by development. Over much of the region less than 30% of the original area remains suitable for shorebird use. Based on a large body of research on the ways that shorebirds feed, particularly by John Goss-Custard and his colleagues in Britain, we know that the habitat removal has long-lasting detrimental effects on the size of wintering shorebird populations. We cannot afford to lose another major wintering area, much less one of such singular importance as Bowerman Basin.

Sincerely yours,

J.P. Myers

J.P. Myers
Assistant Curator
Ornithology

JPM:krg

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO SANTA BARBARA • SANTA CRUZ

Reply to:
MUSEUM OF VERTEBRATE ZOOLOGY
2593 LIFE SCIENCES BUILDING
BERKELEY, CALIFORNIA 94720

20 January 1983

Dr. Dennis R. Paulson
Thomas Burke Memorial Washington State Museum
University of Washington
Seattle, WA 98195

Dear Dr. Paulson:

I am dismayed to learn of the possibility that critical intertidal habitat at Grays Harbor now used by massive numbers of migrating shorebirds may be filled and developed commercially.

This locality is already known to be a major staging area for northward-bound shorebirds, and it is also very important for southward migration and as a wintering area. These statements apply to Grays Harbor as a whole, but especially to Bowerman Basin.

The numbers of birds recorded there indicate that Grays Harbor may well be one of the truly critical stopover locations for shorebirds along the entire Pacific Coast, from Alaska to South America. This lifts concerns for the area from the local level to the international level. At least half of the various shorebirds concerned, I would estimate, are moving between high latitude breeding grounds (in Alaska and northwestern Canada, even eastern Siberia) and wintering grounds (at varying distances south, as far as the Chilean coast and the southern half of Argentina). Because of this international significance, I trust the problems at Grays Harbor are getting the active attention of federal agencies such as the Fish & Wildlife Service and private agencies such as the World Widlife Fund.

Why is a certain stopover location used massively by migrating shorebirds termed "critical"? These are places where migrants stop after long and exhausting flights and where they take 5-10 days to recoup and regain weight by feeding and depositing fat.

The general facts and concerns for migrating shorebirds along the Pacific Coast expressed here are backed by papers in "Shorebirds in Marine Environments" (Studies in Avian Biology No. 2), published in 1979 and edited by me. In addition, since 1975 we have had a program of intensive research on wintering and migrating populations of shorebirds at Bodega Bay in central California, sponsored by the National Science Foundation. We have concentrated on one species, the Sanderling, banding and color-marking hundreds of them to get solid data on local movements and in particular on the question of discreteness of local populations relative to suitable stopover and wintering sites along the coast. These data strongly indicate that the individuals of a given sub-population use and re-use year after year a given area, such as the Bodega Bay beach/

lagoon system. The migration of a given sub-population is adapted to the geographic placement of specific and dependable sites, and has been so adjusted over eons of time. Any disturbance or elimination of habitat serving as critical stopover and staging sites thus echoes in the shorebird life of the entire Pacific Coast from the Arctic to southern South America.

It is only with recent, locally intensive banding and color-marking of shorebird populations that we are beginning to realize some of the implications of cutting back yet more on remaining maritime habitat so important to migrating birds, not just shorebirds but many other kinds as well. I have no doubt at all, personally, that were there studies based on large numbers of banded birds moving through or otherwise using Grays Harbor, they would support all I have said about its importance. Here I refer not to the already available results of intensive census work documenting the high numbers of shorebirds moving through and/or wintering at Grays Harbor, but to the evidence expected from banding as to the importance of Grays Harbor as a link in migrating systems involving many areas to the south and north.

I most strongly urge you and your colleagues in western Washington to continue your campaign in behalf of the protection of critical intertidal habitat in Bowerman Basin and the rest of Grays Harbor.

Sincerely yours,

Frank A. Pitelka
Professor of Zoology

P:1

Université de Montréal
Centre de recherches écologiques de Montréal
crem

11 February, 1983

Dr. D. R. Paulson
Thomas Burke Memorial Washington
State Museum
University of Washington
Seattle, Washington 98195
U.S.A.

Dear Dr. Paulson:

Sorry to come so late in reply to your letter dated 22 December 1982.

Taking into account the species of shorebirds and the numbers of individuals observed in the area of Grays Harbor, especially in the Bowerman Basin, as a staging ground, a feeding, a roosting and a wintering site, the Bowerman Basin is a strategic area comparable to the best similar areas of other regions (Atlantic coast of North and South America). As far as I can see by the literature, it supports the highest concentrations of shorebirds on the Pacific coast during spring migrations.

Since a few months, I am documenting and evaluating the habitat losses for shorebirds along the northern coast of South America. The good staging areas for spring migrant as well as fall migrant shorebirds are dangerously decreasing in some regions. Good staging areas are particularly important in the U.S.A. and southern Canada because, as we can see by fat deposit studies, such areas provide the shorebirds with the necessary food requirements for depositing the energy reserves necessaty for the flight to the breeding areas in Arctic regions, and facing inclement conditions on the breeding grounds before or at the beginning of the nesting activities.

I really have difficulties in understanding why, in 1983 and in the U.S.A., it can't be possible to developpers and planners to find places for marine-related industries outside good wildlife habitats.

Consequently, I strongly support all efforts to save the Greys Harbor and Bowerman Basin shorebirds habitats.

Very sincerely,

Raymond McNeil

5858, chemin de la Côte-des-Neiges, bureau 400, C.P. 6128, succursale A, Montréal, Québec, H3C 3J7, téléphone: 343-6190

LITERATURE CITED IN APPENDIX C

Albright, R., R. Hirschi, R. Vanbianchi, C. Vita. 1980. Coastal Zone Atlas of Washington, Vols. I & II. Prepared for Washington State Department of Ecology.

Albright, R., and D. Armstrong. 1982. Corophium spp. productivity in Grays Harbor, Washington, Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies. Prepared for the Seattle District Army Corps of Engineers.

Darnell, R.M. 1976. Impacts of construction activities in wetlands of the United States. Prepared under contract for the U.S. Environmental Protection Agency, Office of Research and Development, Corvallis, OR.

Fry, K. 1981. Migratory bird use of sites affected by dredging activity in the Fraser River Delta, bird use of experimental dredge spoil islands from March 1980 to March 1981. Interim Report. Canadian Wildlife Service.

Goss-Custard, J.D. 1979. Effect of habitat loss on the numbers of overwintering shorebirds. In Shorebirds in Marine Environments, F.A. Pitelka (ed.). Studies in Avian Biology No. 2, Cooper Orn. Soc.

Herman, S.G. 1978. Unique Wildlife Ecosystems. Report submitted to the U.S. Fish & Wildlife Service Report. Olympia, WA.

Herman, S.G. and J.B. Bulger. 1981. The distribution and abundance of shorebirds during the 1981 spring migration at Grays Harbor, Washington. Grays Harbor and Chehalis River Improvements to Navigation Environmental Studies. Prepared for the Seattle District Army Corps of Engineers.

Isleib, M.E. 1979. Migratory shorebird populations on the Copper River Delta and Eastern Prince William Sound, Alaska. In Shorebirds in Marine Environments, F.A. Pitelka (ed.). Studies in Avian Biology No. 2, Cooper Orn. Soc.

Kaiser, G.W. 1981. Migration of the western sandpiper (Calidris mauri) through the Fraser River Delta of British Columbia. Canadian Wildlife Service Report.

Paulson, D.R. 1980. The importance of Grays Harbor, especially to migrating and wintering shorebirds of the Pacific Coast. Written testimony presented December 10, 1980 to the Grays Harbor Estuary Task Force Meeting, Aberdeen, WA.

Senner, S.E. 1977. The ecology of western sandpipers and dunlins during spring migration through the Copper-Bering River Delta System, Alaska. M.S. thesis, Univ. of Alaska, Fairbanks.

Senner, S.E. 1979. An evaluation of the Copper River Delta as critical habitat for migrating shorebirds. In Shorebirds in Marine Environments, F.A. Pitelka (ed.). Studies in Avian Biology No. 2, Cooper Orn. Soc.

Senner, S.E., G.C. West, and D.W. Norton. 1981. The spring migration of western sandpipers and dunlins in southcentral Alaska: numbers, timing, and sex ratios. Journal of Field Ornithology 52:271-284.

Senner, S.E. and E.F. Martinez. 1982. A review of western sandpiper migration in interior North America. The Southwestern Naturalist 27:149-159.

Theberge, L. and D.F. Boesch. 1978. Values and management strategies for nonvegetated tidal wetlands. Virginia Institute of Marine Science and School of Marine Science, College of William and Mary. Glouster Point, VA.

U.S. Army Corps of Engineers, Seattle District. 1976. Maintenance dredging and the environment of Grays Harbor, Washington, Appendices A through N. Seattle, WA. See especially Appendix G: Impact of dredging on the fishes of Grays Harbor by Bengston, C. and J. Brown, and Appendix H: Impact of dreging on the avian fauna in Grays Harbor by Smith, J.L. and D.R. Mudd.

U.S. Army Corps of Engineers, Waterways Experiment Station. 1974. Identification of objectional environmental conditions associated with confined disposal areas. Dredged Material Research Program. Contract Report D-74-4. Vicksburg, MS.

Washington Department of Game. 1975. A baseline survey of significant marine birds in Washington State. Coastal zone environmental studies report.

PERSONAL COMMUNICATIONS

OCRM staff (Ben Mieremet and Gina DeFerrari) express appreciation to the following individuals who provided information relating to the environment and impacts associated with plan approval through personal communications over a period of several years since scoping began on DEIS preparation.

Bottorf, Jim. U.S. Fish & Wildlife Service (Olympia)
Graeber, Bill. Washington State Department of Fisheries
Herman, Steven. Evergreen State College
Herrington-Tweit, Bill. Black Hills Audubon Society
Howe, Marshall. U.S. Fish & Wildlife Service (Migratory Non-Game Birds)
Lattin, Stan. Port of Grays Harbor
Meyers, Pete. Academy of Natural Sciences of Philadelphia
Paulson, Dennis. Burke Museum, University of Washington
Schuldt, Dave. Seattle District Army Corps of Engineers
Senner, Stan. Hawk Mountain Sanctuary Association
Weinmann, Fred. Seattle District Army Corps of Engineers

APPENDIX D

VARIOUS ARTICLES ON THE GHEMP PROCESS

"The lasting benefits that society derives from [wetlands] often far exceed the immediate advantage their owners might get from draining or filling them. Their destruction shifts economic and environmental costs to other citizens—often in other states—who have had no voice in the decision to alter them."
—The President's Message to the Congress, May 23, 1977

COMPROMISE AT GRAYS HARBOR

DANIEL JACK CHASAN

Brown mud slopes up gradually from the salt water's edge. Above the brown, the slope is coated by a growth of mossy green. Beyond that, an expanse of tall yellowish grass ripples in the wind. Not far from this patch of marsh, on the northern shore of Grays Harbor, stand the pipes and stacks and rusting metal buildings of a huge pulp mill. Logs float in booms along the shoreline, lie in great heaps on the land. Lift trucks pile them on the aging freighter *Seizan Maru* for shipment to Japan. The foul smell of pulp mill effluent rises from settling ponds. Nearby, the port-and-logging cities of Aberdeen and Hoquiam crowd down to the water's edge. In the distance, a great cloud of smoke rises from a slash burn in the eastward hills.

At first glance, it seems inevitable that sooner or later, the port facilities and

Reprinted with permission from the author.
From PACIFIC SEARCH, February 1978

industry will spread out over the marsh. Dredges will deposit their spoils along the shore. Bulldozers will flatten out the fill. Pavement will be laid, buildings erected, and an otherwise-worthless patch of land brought into the local economic system.

Not long ago, that transformation probably would have been inevitable. It is not inevitable now, largely because there are people in government agencies who do not consider the land worthless and will fight tooth and nail to prevent the wholesale filling in of this or any other estuary. In Grays Harbor, they've been fighting for some time.

Estuaries—enclosed arms of the sea in which salt water meets and mixes with fresh—are valued by biologists for the great quantity and diversity of life that feeds in the shallow waters and adjacent marsh. Phrases like "web of life" are often used to describe the complex ecosystems that flourish among the eelgrass and pickleweed and bulrushes and sedge, and the biological productivity of such areas is often compared favorably with the productivity of land given over to human agriculture. That field of yellow-green grass rippling in the wind produces more living matter per acre than anything human beings grow except a field of sugar cane. It dies down completely every year, decomposes, and ultimately nourishes everything in the food chain, from the brown diatoms and green algae on the mud to salmon, steelhead, and occasional whales in the water, and the ducks, herons, and other waterfowl in the air.

Grays Harbor, which covers some 55,000 acres on the Washington coast, is connected to the Pacific by a narrow channel that separates the spits of land on which stand the resort towns of Westport and Ocean Shores. Fresh water flows into it from the Chehalis, Hoquiam, and Humptulips rivers. It supports more than 50 species of fish, including salmon and steelhead spawned in the rivers, large populations of oysters, clams, and crabs, and 325 species of birds, one-third of all the species found in Washington State.

A Western estuary the size of Grays Harbor "is such a rare thing," Nancy Thomas, president of the Washington Environmental Council, has remarked. "If you look down the Pacific coast from Washington, after Grays Harbor and Willapa Bay you have to go down to Coos Bay and San Francisco before you find another major estuary of this size. You don't mess around with it until you know what the impact will be."

Actually, people have been messing around with Grays Harbor since the beginning of this century. Aberdeen, Hoquiam, and the Chehalis River towns of Cosmopolis and Montesano have been exporting wood products ever since then, and the shipping channel has been dredged repeatedly. Spoils from the dredging have been deposited in marshy areas, and portions of the shoreline have become the habitat not of wildlife but of human commerce and industry. "Between 1940 and 1975, dredgings were dumped on about 3,850 acres of intertidal areas," game biologist David Mudd has written in *Washington Wildlife*. "We don't know how much eelgrass and salt marsh was lost, but 1950 aerial photos show eelgrass and salt marshes where upland areas now exist."

The filling of Grays Harbor according to the dictates of economics and convenience did not stop with the passage in the 1970s of the federal Water Pollution Control and Coastal Zone Management Acts, the resurrection of the federal Rivers and Harbors Act of 1899, or the passage of the state Shorelines Management Act, but its progress became much less swift and sure. Federal and state agencies that were committed more to the preservation of the natural environment than to industrial progress gained both the power and the willingness to hold up permit applications indefinitely, and they began to use that power. Boise Cascade had an application for waterfront filling held up for two years. Finally, the company announced that if its application wasn't approved within two weeks, it would abandon its expansion plans. The Port of Grays Harbor and the nearby municipalities, conscious of the area's high unemployment and its limited attractiveness to industries not dependent on logs, were eager to have Boise Cascade go ahead. Pressure was applied, and the permit was granted—with the understanding, however, that Boise Cascade's would be the last major permit granted before all interested parties had developed an overall plan for the estuary.

Biologists value estuaries for the profusion of wildlife they support. But portions of the Grays Harbor shoreline now support commerce and industry, not wildlife.

Things didn't work out that way. It wasn't long, in fact, before a much more ambitious and much more intrusive filling project was on the drawing boards: the Kaiser Steel Company wanted to fill 45 acres, including 39 acres of wetlands, to create a site for the assembly of offshore drilling platforms. The Port was delighted. The Grays Harbor area depends heavily on the forest products industry, with its wild swings in employment. Here was a chance to get an entirely new kind of industry.

The "resource agencies" (those state and

WILLAPA BAY: An End to Dredging

Willapa Bay, which occupies most of coastal Washington between Grays Harbor and the Columbia River, is the last relatively unspoiled large estuary in the United States. It is not currently threatened by development; but only a few years ago, it was the place where the major environmental battle over Northwestern estuaries was happening.

For many years, the U.S. Army Corps of Engineers had kept a channel for deep-draft vessels dredged through the mouth and northern body of the Bay, between the Pacific and the port of Raymond. As at Grays Harbor, the channel tended to silt up, and the only way to keep the port in business was to dredge. Spoils from the dredging were deposited on marshland.

The channel was cleared routinely, with little or no controversy, until the early 1970s, when the Corps put together a feasibility study and a draft environmental impact statement for continued dredging. A number of environmental groups protested vehemently, and the Board of Engineers for Rivers and Harbors, sitting in Washington, D.C., refused to authorize the additional studies that would be needed if the dredging were to go ahead.

The project was stalled but not forgotten, and it became increasingly controversial. Environmentalists argued that, as a large and valuable estuary, Willapa Bay should be allowed to exist in its natural state. Advocates of dredging argued that no dredging meant no more deep-draft vessels at Raymond, which meant no more jobs loading logs or lumber on the Raymond docks.

In 1975, the Corps issued another, more carefully drafted impact statement, which included a rigorous cost-benefit analysis. According to the Corps' calculations, the economic benefits of dredging promised to be only 56% of the cost. By that time, Weyerhaeuser, whose logs were the ones being shipped through Willapa Bay, had evidently decided on its own that using the port of Raymond wasn't especially profitable. Weyerhaeuser and the Corps both reasoned that it would be cheaper to truck the logs to Grays Harbor, a short drive up Route 101, and load them on ships there. The Corps decided not to dredge for deep-draft vessels after 1977. That decision implied at least three things: Willapa Bay itself would not be used or developed as a conduit for ocean shipping; Raymond would be consigned to eventual oblivion as a port; and the pressure to maintain and expand the Port of Grays Harbor would increase.

D.J.C.

federal units responsible for protecting natural resources) opposed the fill. But local officials wanted it very badly, and besides, the manufacture of drilling platforms seemed to further the national policy of developing domestic energy resources. A lot of political pressure was brought to bear. Finally, Senator Henry Jackson's office got into the act. The Kaiser project should go ahead, Jackson's representative said, but the practice of fighting over every permit application that came down the pike had to stop; after the Kaiser permit was approved, all the contending parties had better work out a plan for the estuary. (The filling was done right away; but at this writing, ironically, a poor market for drilling platforms has kept Kaiser from building anything on the fill.)

This time, something happened. At the end of 1975, the Grays Harbor Regional Planning Commission set up an Estuary Planning Task Force, which included representatives from the Port of Grays Harbor, all the nearby municipalities, and the eight state and federal agencies that had some form of jurisdiction in the estuary. The first step was hiring the Salem, Oregon consulting firm of Montagne-Bierly Associates to coordinate the planning process. (In the early 1970s, as an Oregon state official, Roland Montagne had presided over the creation of a successful management plan for the lower Willamette Valley.) Montagne's first move was to assemble a technical committee to compile the necessary information. Then, in February, 1977, the Estuary Planning Task Force began to work out a plan.

The Task Force was a wildly disparate group, united only by a common dissatisfaction with the way things were going and a common apprehensiveness about the future. The Port and municipalities did not like the delays and uncertainty of the permit process; the resource agencies did not like the piecemeal nibbling away at the estuary. Without an overall plan to which all parties agreed, there was little chance that the situation would improve from either point of view.

Without an overall plan, every development proposal meant a new battle.

To begin with, the factions were poles apart. The Port, which wanted to preserve Grays Harbor's position as the only deep-water port on the Washington coast and realized that a lot of space was one of its chief assets, wanted freedom to develop all of the 2200 acres it owned along the harbor's northern shore. The municipalities, which favored development, were jealous of their local jurisdiction and resented any meddling by outside agencies. And the meddlers, the people from the resource agencies, were determined to stick to their guns and approve filling only on a case-by-case basis.

They felt that any loss of wildlife habitat in the estuary was significant.

"The first thing they say," one biologist observed, "not just in Grays Harbor but all over, is 'how much development does it take to have an impact?' It's as if I said to you, 'O.K., I'm going to start chopping off your fingers one by one. How many do I have to chop off before you become unfunctional?'"

The resource people and outside observers from the environmental movement would have been happy to see dredging and filling in Grays Harbor stop completely. Liz Greenhagen, a vocal Ocean Shores resident who has followed the planning process from the beginning—she refers to herself as the "token environmentalist" in the cast of characters—says that has never been realistic. "You can come down from someplace else," she says, "and say, 'wouldn't it be nice to save a whole estuary,' but you can't really do that. Living here you can't just be anti-dredging, because

our economy depends on it." You can, however, try to "show the port and great planning authority that the estuary is good for something besides dredging and filling."

When the various interested parties sat down together, approaches to planning differed sharply. Local officials were more interested in specific development projects—a Thunderbird Motel turned out to be a big one—less interested in the generalities of planning, and much less at home with the maps and charts and technical data with which the plan was being forged. Resource people, partly because of their backgrounds, focused more intensely on technical details, realizing the need, for example, to figure out exactly what marshland is, and to determine where it begins and ends. Whatever the reasons, it became clear that the participants weren't all on the same wave length. Late in the planning process, after hours of heated argument over developing the part of the northern shore (on which the Kaiser fill already jutted into the water like a huge, rip-rapped parking lot), one local mayor consulted a map and concluded that the area was, and was scheduled to remain, all but totally natural.

This group, as edgily self-conscious as a convention of lions and lambs, was supposed to come up with a detailed plan for the whole Grays Harbor estuary. Observers have compared their proceedings to difficult labor-management negotiations. Certainly, the more intense sessions fit that description. At first the consultants (Montagne and Gordon Davis of the firm of Wilsey and Ham, who actually ran the meetings) steered the group away from the touchier subjects. And within the sessions, there was some pressure to avoid conflict by simply abandoning certain areas to development. The resource people resisted. Why not just keep Willapa Bay largely unspoiled and develop Grays Harbor intensively? Because Grays Harbor was valuable in and of itself, and habitat lost there would not be replaced. Why not preserve the south shore of the Harbor, which now, except for pilings and log booms, presents a largely unbroken line of marsh and alders, and develop the north? Because the north side is more productive, and again, habitat lost is habitat lost. Why not forget about the largely developed area around the eastern end of the Harbor, most of which was already zoned commercial and industrial, and preserve portions closer to the ocean? Because with a higher percentage of fresh water and with finer sediment, the eastern end was more productive. And so on.

The touchiest area of all was the one behind the airport, Bowerman Field, on the northern side of the main channel. When this area came onto the agenda, the meeting lasted far into the night and resumed the next morning. One side would caucus, then come in and present a proposal. The other side would then caucus, and come back with a counter-proposal.

The area "is the subject of quite a battle between the Port of Grays Harbor and environmentalists," *The Aberdeen World* reported. "The Port wants to fill the land—three square miles of it if possible—with dredge material and lease it to heavy industry, while representatives of state and federal agencies have indicated that they would like the expanse of grassy marshland preserved....When [Hank] Soike [general manager of the Port] indicated the Port's wishes by sweeping his hand across an aerial photograph of the area....a couple of the resource agency representatives gasped indignantly....[Stan] Lattin [planning director of the Port] then directed the group's attention to a large map, where the Port's version of an adequate industrial site was blocked out in purple....

" 'No way would we allow filling of that entire purple area,' said Ron Lee of the Environmental Protection Agency. 'It's just too expansive.'

" 'That's more fill than I think we'd look at nationwide in five years,' [Chuck] Walters [of the National Marine Fisheries Service] added. 'This kind of a chunk is like giving you several gold mines. I just can't see it.'

"Soike then offered to cut the Port's proposal by two-thirds, but when the resource representatives received no assurance that the Bowerman Field site is the only major filling planned, the task force stalemated....

"Said Walters: 'I just spent a week testifying against a sixth-of-an-acre fill, and now I have a 500-acre fill proposal. I don't

know how that's going to go over....' "

Eventually, the two sides worked out a compromise: the Port would limit its expansion plans to 500 acres over the next 50 years. The resource agencies would resign themselves to the development of those 500 acres. Both sides had made significant philosophical concessions. The Port was renouncing for 50 years the right to do as it pleased with land it owned. The resource agencies were renouncing the right to protect the development of 500 acres of the most preciously productive habitat on earth. For people used to haggling over sixths of an acre, the idea was staggering.

The compromise could set a national precedent for settling wetland disputes.

"The Fish and Wildlife Service basically got the short end of the compromise," suggests Dale Jones, Northwest representative of Friends of the Earth. "The Fish and Wildlife Service tries—the people who worked on this should get a pay raise—but politically, they just don't have the muscle to cope." Another observer suggests, though, that "the resource agencies have been viewed as kind of poor boys, and they like that image, but don't kid yourself—they pull a lot of power out of Washington, D.C. I don't think they got the short end of the stick in Grays Harbor. I think they got a pretty good compromise." Certainly, the municipal officials—who must live with their constituents, as well as the plan—felt that they had given up a great deal, too.

In fact, a good many of the people involved probably felt like those described by the wise old attorney who noted that in a "good settlement" both sides always go away from the table "a little sick to their stomachs."

By now, the whole estuary has been divided into planning areas, and detailed specifications agreed on for the amounts and kinds of development that can take place in each of them. All the participants have approved the plan. Now, if it is to be more than an abstract declaration of intent, it must be incorporated into local zoning codes.

A lot of people far from Grays Harbor are watching closely to see just exactly what it does become. Because Washington was the first state to gain federal approval for its Coastal Zone Management Act, the planning done in Grays Harbor with Coastal Zone Management money is viewed as a possible precedent. "We think this has national significance," says Hank Soike, manager of the Port of Grays Harbor, and Montagne says the plan marks "the first time something like this has been done on this grand a scale."

And because—with President Carter's executive order of May 1977—saving wetlands has become a national policy, ports all over the country are more than casually interested in how conflicts between wetlands and port development are worked out. The Northwest offers a couple of interesting examples in addition to Grays Harbor. In the port of Everett, Washington, a conflict between preservation and development is being worked out through mediation. In Oregon, a state law now says that before any part of an estuary can be developed, the development must be formally judged to be in the public interest. If it is judged in the public interest, then any loss of estuary habitat must somehow be "mitigated." At Coos Bay, when the airport expanded out into the estuary, the loss of habitat was mitigated by returning an equal portion of the bay, enclosed behind old dikes, to its natural state.

Ultimately, the people who have grown concerned about the Grays Harbor estuary believe that the essential job is not planning, but education: the public must be taught the value of estuaries in general. An understanding of the processes that go on there is crucial, because no one is going to make an effort to save marshes or eelgrass beds for themselves. "One of the problems we have with estuaries," says Dale Jones, "especially the Washington estuaries, is that they don't have the beauty of a Mount Rainier." Bob Bowker, a Fish and Wildlife Service biologist who served on the Estuary Planning Task Force, suggests that people must learn "to tie the habitat to the critters"—that is, to realize that the profusion of fish and animals that they value can't exist without the marsh and grassy water that they don't value.

In the Grays Harbor area, commercial fishing, sport fishing, and tourism all depend on the salmon and steelhead that pass through and spend varying lengths of time in the estuary. If you ask a state Game Department biologist why one should even try to save areas near the huge Rayonier pulp mill, for example, he may reply that all the anadromous fish that spawn up the Chehalis and its tributaries must pass by that point. The mouth of the Chehalis is already heavily developed. Steelhead planted upriver by the state return at a rate of .5%. Farther west, in the largely undeveloped Humptulips, the rate of return is 5%.

So far, there has been no outpouring of sentiment in favor of saving the estuary for the fish. But Stan Lattin suggests that the planning process has educated many of the participants and various other local civic leaders, if not the public at large, to the fact that the issue is not simply one of saving worthless mudflats. By now, he says, when those people look at the estuary, "they know that something's going on there." That alone, he believes, is enough to justify the time and effort spent on planning. Greenhagen almost agrees. "I'm interested in reaching more people," she says. "It's bigger than just Grays Harbor."

Compromise plan on estuary may satisfy both sides

Source: DAILY WORLD
Aberdeen, WA 12/10/80

By SANDY NELSON
World Staff Writer

The Grays Harbor Estuary Management Task Force modified its original plan Tuesday, offering a new proposal that could ease the five-year stalemate between concerned conservationists and those who say waterfront development is vital.

The task force learned during public testimony Monday that its proposal to fill Bowerman Basin — the 500-acre mudflat between Highway 109 and Hoquiam's Bowerman Field — may threaten the existence of the endangered peregrine falcon.

On Tuesday, the panel — composed of representatives from 16 state and federal agencies and local municipalities — threw out its original agenda, rehashed the problem and bounced back with a compromise plan that could preserve the estuarine habitat for migratory birds while giving industry a place to grow.

If approved, the new design would extend Moon Island — also known as the Bowerman Field peninsula — westward with fill material in an effort to preserve the mudflats to the north.

"WE'VE SEEN some positive changes in the direction the task force has taken," said David Ortmann, Northwest representative of the Friends of the Earth and one of the most outspoken critics of the original plan. "We're much more hopeful that our plans will be addressed in the near future, and it looks like there's a possibility of resolving the conservation-development stalemate that has developed."

Pat Dugan, director of the Grays Harbor Regional Planning Commission, which initiated the task force five years ago, said he was optimistic despite the fact that the new twist represents "another significant delay (in the planning process)."

"I'm still firmly committed to what we're doing," he said. "The process takes a long time, but I think it works. We've got significant practical problems in reaching compromises, but I'm still optimistic."

IN THE original draft plan, the Port of Grays Harbor offered conservation easements on its 1,700 acres of wetlands west of Moon Island if it could fill the Bowerman Basin for industrial development.

That plan has met opposition since its inception. Environmentalists and fishermen fear that any filling of the mudflats would endanger the ecological balance for fish, birds, crabs and other creatures that live there. And Monday, the task force heard scientific testimony that Grays Harbor — and specifically, the Bowerman Basin — seems to be a crucial staging area for migrating shorebirds and may be critical to the survival of the peregrine falcon.

Planners formed a mini-task force Tuesday to investigate the feasibility of the new design and to determine what the environmental impacts of a westward extension would be.

The mini-task force is composed of representatives from the City of Hoquiam, the Environmental Protection Agency, the Port of Grays Harbor, the Army Corps of Engineers and fish and bird specialists.

A representative from the Office of Coastal Zone Management said the new plan will be assessed along with the original plan, and U.S. Fish and Wildlife Service biologist Rich Howard said he could render a biologic opinion on both plans by Feb. 25.

HOWARD HAD testified Monday that Grays Harbor, while an important wintering ground for the endangered falcon, was not a critical habitat, and he said the original plan to fill Bowerman Basin would not jeopardize the bird.

He conceded, however, that further study was needed before he could conclude that the Bowerman Basin was not crucial to the falcon's survival.

Joe Blum, area manager for the U.S. Fish and Wildlife Service, said Tuesday that Howard's testimony had been a "rough" opinion, and that the final opinion would be ready by Feb. 25.

"If it's a jeopardy opinion, we'll work with the task force and the Office of Coastal Zone Management to see if planning can go on in a way that won't impact the species," Blum said. He assured the task force that the federal agency would not compromise its biologic knowledge and principles in its evaluation of the plan.

GORDON DAVIS, consultant to the task force, guided the group through the exhaustive discussions Tuesday morning that led to the new plan.

John Clark, a representative of the Conservation Foundation in Washington, D.C., initially suggested that the basin habitat could be duplicated west of Moon Island "since Bowerman Basin is a man-made creation in the first place."

"I accept the evidence presented yesterday showing that shorebirds use the basin and that it's a most valuable habitat," Clark said, "but I don't accept that it's the only important staging area for birds in this area.

"It would appear feasible to use fill material to extend the basin to the west (of Moon Island) and replicate that habitat."

Research should precede such a move, Clark said, adding that it would involve the loss of 500 acres of open water in the Harbor — two percent of the available space. "If it (the basin) is a major staging area for shorebirds, people in the community have a responsibility to establish a sanctuary in Bowerman Basin," Clark said.

CHUCK WALTERS of the National Marine Fisheries Service in Washington, D.C., warned that a westward reconstruction of the basin may bring other unforseen impacts, but he favored considering alternatives that could lessen the environmental impact so development can proceed.

The task force decided to proceed with the proposal to extend the airfield peninsula, rather than attempting to reconstruct the basin.

It will meet again March 3 and 4 at an undetermined site to consider the new plan and to work out other changes in the draft document.

Source: The Coastal Society, BULLETIN, Vol.3, No.2, March 1979

Planning for Predictability in Grays Harbor

Grant Dehart,
Federal Office of
Coastal Zone Management

Editor's Note: Representatives of the Port of Grays Harbor and Friends of the Earth will review this article and provide their views on events in Grays Harbor, including the planning process and the plan in the June issue of the *Bulletin*.

Over the past three years, the Grays Harbor estuary in Washington State has been the focus of an innovative planning process which has recently gained broader national attention from coastal managers, environmentalists, port interests and Federal agencies. This increased attention is due to the potential for such a process to become a prototype for resolving conflicts between economic development and environmental protection needs in specific geographic areas of the coastal zone.

The process may offer a solution to some common criticisms of completed state CZM programs, e.g. the lack of specificity, the need for more long term protection of specific resource areas, uncertainty for permit applications and conflicts among government policies. With the Grays Harbor example in mind, the Federal Office of Coastal Zone Management has introduced the concept of "special area management." Whether the Grays Harbor process and estuary plan becomes a prototype for this "special area management" concept or not will probably depend upon what government officials and influential interest groups think about:

- directly involving State and Federal agencies in the development of local and regional plans for wetlands and shoreland areas.
- committing Federal and State agencies to planning decisions in advance, to narrow their discretion on individual permits, thus increasing the predictability of the permit process,
- trading off a specific amount of tidal wetlands to economic development for the long-term preservation of the vast majority of remaining wetlands in the estuary.
- mediating environmental disputes among government agencies, while keeping citizens in an observer or advisory role.

The Grays Harbor estuary is one of the largest on the Pacific Coast, with an area of about 62,500 acres of tidal marsh and partially developed shoreline. The estuary supports more than 50 species of fish. It is also the location of six towns that depend upon the shoreline for their economic survival, particularly from ports, timber processing, fishing and recreational boating. Grays Harbor is the only port with deep water access on the coast of Washington (outside of Puget Sound), and is of major significance to the economy of the region and the State. The 12 mile navigation channel through the estuary requires annual maintenance dredging.

The stage was set for the present planning process when State and Federal offices refused to support further applications for dredge and fill projects until an overall plan for the estuary was agreed upon. This action was prompted by a long and bitter controversy over a 45 acre fill by Kaiser Steel Company, and was generally supported by the major parties to the dispute, since they realized that the impasse that existed was detrimental to all of their interests. A Grays Harbor Estuary Planning Task Force was established with representatives from the county, the municipalities around the estuary, the Port of Grays Harbor, four State and four Federal agencies with legal jurisdiction in the Harbor, and the Regional Planning Council. After the Washington Coastal Zone Management plan was approved, Federal CZM funds provided for a planning study and consultants were hired to act as technical advisers, planners, and mediators.

The Grays Harbor process appears to have four major goals, including:

- consensus on a specific 50 year plan for the estuary, among all public agencies with legal jurisdiction over its use,
- "predictability" that activities permitted in the plan will have the general concurrence of all agencies involved in finalizing permit decisions,
- "balance" between competing needs for economic development, and protection of natural functions and areas of the estuary, and
- management of cumulative impacts from incremental dredge and fill decisions.

For more than two years, since September 1976, the Task Force and its consultants have worked to develop a plan that will be acceptable to all parties with legal responsibility for its implementation. They have also attempted to involve interest groups and the public in the plan development, but have not been successful in gaining full support of environmental interest groups that are concerned both with the extent of their involvement and the substantive policies being proposed.

The major compromises that were reached in the draft plan include:

- The Port of Grays Harbor agreed to abandon its plan for the development of 2200 acres of submerged lands along the harbor's northern shore, for assurances that it could develop 500 acres between the Bowerman Air Field and the shoreline in Hoquiam over the next 50 years. This amount was split in half, so that only 250 acres would be allowed until the need for the additional fill is demonstrated and the detailed plans for the first segment are subjected to special review by affected agencies. No decision was made on the use of this area after 50 years.
- The remainder of the Port's 2200 acres is to be transferred to a designated state resource agency for 50 years, to be managed for resource purposes.
- Further major filling of the submerged lands was limited to bankline straightening or bankline erosion control in the least naturally productive portions of the harbor.

• Long-term policies for relocation of non-water dependent uses along the harbor, such as an airport, was approved subject to the location of a suitable alternative site.

The Task Force is now reviewing a revised draft of the plan. At the same time, environmental interest groups seem to be organizing opposition to the plan; the port is seeking support for the plan from Congressional and headquarters Federal officials; EPA is considering revisions to Section 404(b)(1) of the Clean Water Act that could affect major proposals in the plan, and the Office of Coastal Zone Management together with participating Federal agencies, is preparing a Joint Draft Environmental Statement in anticipation of formal amendment to Washington's CZM program.

With some of the most controversial issues yet to be resolved, some agencies have begun to question whether such a process actually saves time. Others maintain that the controversial issues would be raised in the permit process in any case, and they should be dealt with in advance through the plan and NEPA process.

The procedural issues include:

• The adequacy of citizen and interest group involvement in the plan formulation.

• The extent to which agencies are committed to major decisions (as a result of the consensus process) in advance of open consideration of alternatives under NEPA.

How the formal review, EIS and approval process can be coordinated with so many layers of government decisions involved, (e.g. local plan amendments, state Shoreline Management Act approvals, Federal agency approvals, and amendment to the Washington CZM program).

• How much discretion over subsequent permit applications is being surrendered by Federal and State agencies that approve the plan . . . for the sake of predictability.

• Whether the 404(b)(1) guidelines, requiring consideration of alternative disposal sites can be met through such a planning process without full review of alternatives for each permit application.

• Whether an approved long-range plan will prevent further unplanned losses of wetlands due to political intervention.

• Whether making the plan legally or formally binding on participating agencies will inhibit their cooperation in future planning efforts.

Several substantive issues of significance beyond Grays Harbor are also likely to be raised about the proposed plan, including:

• Whether a proposed 250 acre fill for Port development can be authorized in advance of a permit application specifying the use; or at all, given the President's executive order on wetlands,

• whether non-water dependent uses that are ancillary to primary port functions should be sufficient justification for filling wetlands,

• whether long-term preservation of existing wetlands is a sufficient trade-off for filling, without an acre-for-acre replacement with new wetlands to mitigate the loss,

• the adequacy of environmental data available to the Task Force, upon which consensus decisions were based, and

• the adequacy of an estuary planning boundary that does not include the entire watershed. (The Grays Harbor planning boundary was limited to the Section 404, and Shoreline Management areas).

During the remainder of the planning and review process each of these issues and many others will be debated at all levels of government, before a final plan is approved.

Hopefully, this article and those that follow will help keep the debate on a constructive track.

Throughout the country environmental programs are under attack for being inflationary, unpredictable and inequitable. At the same time, national polls of environmental values, and state referenda on coastal and land use programs show sustained public support for the basic goals of these programs. The challenge for coastal zone management is how to improve the implementation of management policies before programs are dismantled, or the permit processes are circumvented by political intervention on a large scale.

Grays Harbor, prior to this planning process, represented only one example where ad-hoc, agency-by-agency review of development proposals can lead to highly-charged conflict situations in which government, interest groups and the environment end up losers. Similar cases can be found throughout the coastal zone at any time.

The Grays Harbor planning process represents a positive attempt to improve this situation, but the controversy is not over. Government agencies will worry about the potential loss of nearly unlimited discretion over individual projects; environmental interests may challenge the resolution of disputes that are less-than-perfect in terms of protection, and development interests may balk if some of the concessions to economic development are reconsidered or if predictability is not maximized.

There are other prototypes for "special area management," such as The San Francisco Bay Plan, The Plans for Yaquina Bay and the Lower Willamette River in Oregon, and the Joint Processing of Permits in the Corp's Norfolk, Va. District, and other solutions to the permitting maze, besides the Grays Harbor process. But there are a lot of positive aspects about this process that should not be discarded prematurely in the rush to protect parochial interests.

Source: The Coastal Society BULLETIN
Vol.4, No.4, July 1979

Coastal News

Planning for Predictability in Gray's Harbor: Part II

Editor's Note: In the March, 1979 Bulletin, we published an article by Grant Dehart describing the goals and process of planning for predictability in Gray's Harbor. Some of the principals involved have different views on these planning activities. The articles below were prepared by representatives of two groups that have been actively involved in Gray's Harbor.

The Case for Planning

Pat Dugan
Executive Director
Grays Harbor Regional Planning Commission

A previous article in this journal (March 1979) discussed a planning process now taking place relating to the future management of the Grays Harbor Estuary on the Pacific Coast of Washington State. That article addressed many of the specific issues which confront that process and by so doing illustrates the complexity that arises in such an effort. It is not the intent of this responding article to debate those issues in the limited forum provided here. Such a debate, which involves many issues unique to the Grays Harbor system, would have little practical benefit to the readers. Far more important to the management of coastal areas throughout the nation is a need to accent and clarify the very fundamental reason to undertake this type of planning effort. When the process began, it was assumed that "planning" was a commonly held concept among all the various regulatory agencies and interest groups involved in the management of coastal areas. Our experience has suggested that this may not always be the case. The purpose of this article, then, is to present our case for "planning" an estuary. That purpose must first be accepted before any resolution to the many issues confronting estuarine protection and development can be addressed.

The first concept that must be clarified in such a discussion is what planning is understood to be. For the purposes here it is intended to mean, as an end product, the allocation of space for various uses and activities (including preservation) within an area. Since the desirability of allocating space to a particular use or activity in a given subarea will inherently depend on how the use or activity is undertaken, planning also involved developing policies and conditions relating to particular subareas or particular uses and activities. This concept of planning involves a policy commitment to allow the uses and activities specified in the plan if the appropriate conditions are met (and hence the concept of "predictability" addressed in the earlier article). "Planning" here is not intended to be, as it often is in discussions relating to resource management, a euphemism for regulating.

The Grays Harbor process grew out of a long history of frustration among various state, federal, and local agencies regarding the existing permit system for managing the estuary and its basic deficiencies. The current system of managing estuarine environments usually consists of case by case decision making, utilizing uncoordinated regulations and other management programs by various agencies which exercise authority in matters affecting the resource. Since these regulations and programs are frequently developed independent of each other (especially between various levels of government), this situation creates a strong potential for these public agencies to pursue goals and objectives which may or may not be related to one another and which have high potential for conflict between them. It also creates uncertainty regarding the outcome of any project proposal in the estuary area and continues the lengthy permit processes now needed to resolve issues arising out of inconsistent programs of various agencies. Thus, the lack of a coordinated public policy among the many state, federal, and local agencies causes confusion, and frustrates both people seeking permission for various actions and those who are attempting to regulate those activities for the public good.

One of the major drawbacks of the current system is that its ultimate, or cumulative, impact on the environmental quality or ecological productivity cannot be anticipated. This problem is caused by several factors.

First, the current system is oriented toward a case by case review of individual projects as they come up. Consequently, the ultimate impact will depend on which projects are proposed and when, and how effectively each may be advanced and presented in the regulatory and political processes. Second, the existing policy framework under which the individual projects are judged in each agency tend to be general and subject to a wide range of interpretations. Third, the specific standards or criteria for development may vary from agency to agency depending on their basic sense of purpose. For example, a fishery agency would develop standards directed toward the fishery, a game agency may develop criteria primarily directed toward avian fauna, a city may base its standards on a priority need to remove urban blight, and a port may develop its program on a need to create jobs. These purposes may conflict on any given permit issue in a way which makes the outcome uncertain.

The problem of predicting the ultimate effect of individual permit decisions under current management systems poses a serious and potentially long range adverse environmental problem. An estuary is a complex and potentially fragile system. Any one project by itself, if carefully designed and cited, may be acceptable but many such projects may pose a serious threat to the overall system. Also, an acceptable project in present conditions may become unacceptable due to the way the resource may be impacted by future projects. These problems of how a particular project may relate to future projects and future environmental conditions is often referred to as the cumulative effect. Because the case by case approach cannot anticipate

these future problems or conditions, it cannot evaluate cumulative effects of permit decisions.

An additional problem in the existing system is its ability to consider alternatives. While the present system attempts to address concerns regarding the "best" or most suitable alternative for a particular use or activity, it does this very inefficiently. Since the current system responds to specific proposals, it only comes into effect after a proposal is developed, a site selected, ownership questions resolved, and some investments made. These commitments limit the ability to enforce a meaningful alternative analysis. Furthermore, due to potential differences between the various management programs of each reviewing agency and the manner in which the programs are administered, a prospective developer has little guidance as to where his efforts might best be directed. Since the ability to evaluate and influence alternatives is limited, greater environmental damage might occur due to the "best" or "least damaging" site for a particular project not being selected and an "acceptable" but less appropriate or desirable site approved. This problem can become very serious when combined with the cumulative effect of many projects.

While the present system poses these problems for ensuring adequate protection of the natural resources, it also creates potential problems for being able to meet the socioeconomic needs of the affected community.

Just as case by case decision making makes it impossible to evaluate cumulative environmental impacts, case by case decisions also prevent evaluation of the cumulative effects of permit decisions on economic conditions and needs. While one project denial may not be critical to the economy the cumulative effects of permit denials may be very damaging. The present system provides no means by which future needs can be evaluated with the permit under consideration.

The present system is also unlikely to be able to achieve the most optimum balance between environmental and economic needs. Since the case by case review system cannot effectively direct development proposals to the area of least environmental impact, the cumulative effect of individual permit decisions could result in a lower level of economic opportunity for a given level of environmental losses than if it were possible to direct development proposals in advance to the site most capable of accommodating the use. By not optimizing the ratio of economic opportunity to environmental costs, the resulting balance would be lower than that which could be achieved. In other words, the present system has no way of knowing whether it is allocating efficiently whatever level of development the system may be ecologically capable of accepting.

In Grays Harbor the present system led to many long and drawn out permit battles between local development interests and state and federal resource agencies. In these battles both sides were frustrated. Developers were frustrated by not knowing what was expected from agencies charged with managing the system. Agencies were frustrated by a feeling that issues were being decided on factors which did not adequately address resource needs. Virtually every permit question ended up in the "political trenches," as the local vernacular puts it.

In the middle of one of these bitter controversies in 1975, Senator Henry M. Jackson (Washington) urged the various agencies charged with either regulating or developing the estuary to get together and resolve their differences in a planning process. A process was established under the auspices of the Grays Harbor Regional Planning Commission (an association of local governments similar to a Council of Governments in many states). Since the process was to resolve differences between established management programs, the Planning Commission formed a task force of the various state, federal, and local agencies involved to conduct this program. The process then set out to develop an alternative approach to managing an estuary. This approach would consider, in a long range and comprehensive manner, what is needed to protect the natural productive capacity of the system, and what would be needed for the system to perform its economic functions, along with many other roles the estuary plays. This approach, then, would result in a "plan" which addresses the many competing demands on the estuary in the form of policies and use designations. While it was understood that such a plan could not replace the existing permit authorities, it was expected that it would guide decision making under those authorities in much the same way that city comprehensive plans guide zoning decisions. By addressing long term issues, needs and impacts, this approach could correct the deficiencies in the present system.

Once it is decided to undertake such planning, it is then necessary to identify the overall objective of such planning. The Grays Harbor process addressed this question as one of its earliest policy issues. It was decided that the goal of the task force was to manage the system for multiple use. This rather innocuous sounding goal is one of the most significant decisions in the process, since it recognizes that there is a range of legitimate uses that should be accommodated and balanced, and that management cannot only be directed toward special purposes. It was at this juncture that the process departs from the existing system of each agency developing and administering a management program directed at its own special purpose.

This recognition drastically compounds the problems associated with the planning process. As Richard Babcock observed in "Babcock's Law," "any beneficient public policy if pursued vigorously will inevitably conflict with an equally beneficient public policy."[1] The decision to recognize multiple use in an estuarine system inherently recognizes the existence of more than one legitimate public policy which will be pursued vigorously by various interests, and, hence, by Babcock's Law, conflict. If the Grays Harbor process has demonstrated anything; it is that Babcock is right. Planning for special purposes is relatively easy. One can protect an ecological system with a high degree of certainty (but not complete) by drawing a line around

the system and prohibiting any further modification within that area. Similarly, very effective economic development plans can be readily formulated if one is not constrained by limits on estuarine modification. It is when both of these objectives are pursued vigorously that planning becomes difficult.

In the previous article Grant Dehart said, "The challenge for coastal zone management is how to improve the implementation of management policies before programs are dismantled or the permit processes are circumvented by political intervention on a large scale." Only through effective, balanced planning can this challenge be met. Whether such planning will be successful will depend upon whether each agency charged with management or development of coastal areas will be able to overcome a natural ingrained reluctance to balance the narrow purpose of that agency with other public purposes and needs. As long as any agency seeks to retain its unilateral discretion in such matters, continued conflict is inevitable. The Grays Harbor process represents a potential prototype process for such a balance to be achieved. It is time to move the question of balance from political rhetoric to actual public policy.

[1]Richard Babcock "Regulating Land Development: Some Thought on the Role of Government," *Land Use: Tough Choices in Today's World,* Special Publication No. 22, Soil Conservation Society of America, Ankeny, Iowa, 1977, page 35.

Grays Harbor and Coastal Zone Management—What Went Wrong?

David E. Ortman
Conservation Representative
Northwest Friends of the Earth

Whether or not the Grays Harbor estuary planning effort in the State of Washington will become a "prototype" for resolving conflicts between economic development and environmental protection needs in coastal zone areas will depend a great deal on the Office of Coastal Zone Management (OCZM) itself. Much of the controversy outlined by Grant Dehart in the March issue of the *Bulletin* is self-generated and a result of OCZM's own ineptness. Friends of the Earth has followed events in Grays Harbor for almost a decade. We are pleased to respond to the issue raised by OCZM.

Directly involving state and federal agencies in the development of local and regional plans for wetlands and shoreland areas is a commendable goal. Efforts should be made, however, to insure that all major interests are involved. For example, the Federal Aviation Administration was not part of the Grays Harbor Estuary Task Force even though there are three airports in the planning area.

Committing federal and state agencies to planning decisions in advance is *not* an acceptable goal without strong guidelines and application of the Clean Air Act and Federal Water Pollution Control Act requirements. The draft Grays Harbor estuary plan was developed without taking into consideration these already existing constraints. Much like a builder constructing a home without referring to the building codes, the existing plan is clearly in violation of the FWPCA requirements and the President's Wetlands Order.

The purpose of the Coastal Zone Management (CZM) Act is (a) to *preserve, protect,* develop and where possible to *restore* or *enhance* the resources of the nation's coastal zone. From 1940 to 1975 nearly 4,000 acres of intertidal land in Grays Harbor, one of the few major estuaries on the entire West Coast, had been utilized for disposal of dredged material. Trading off additional amounts of tidal wetlands to economic development for the long-term preservation of the remaining wetlands in the estuary is acceptable only under the following conditions, neither of which are met by the draft plan. The *first* is the level of protection. If nothing else, CZM planning has illustrated the lack of mechanisms, tools and programs available to protect critical wetland areas. No sanctuaries or wildlife refuges or non-dumping areas are proposed. The only "protection" offered other parts of the harbor (besides Management Unit 13) is zoning which is reviewable every five years. The *second* condition is an adequate test of what constitutes economic development. After a breach of faith on a major wetland permit in Grays Harbor in 1976, when the U.S. Army Corps of Engineers issued a 404 permit for a 45 acre fill which destroyed 13% of the harbor's existing sedge marsh, the conservation community in Washington felt that CZM planning would be a positive effort. The permit was issued, not jointly to Kaiser Steel (who proposed building offshore oil-drilling rigs) and the Port as the Corps EIS stated, but to the Port alone, despite the fact that no need for such rigs was ever shown. This has resulted in an abandoned site (Kaiser released their option on the site this spring) devoid of biological productivity. No longer should Ports be able to claim "economic development" with contracts in hand before a permit is given.

The Wynoochee Dam on the Wynoochee River near Grays Harbor above Aberdeen, Washington, provides a perfect example. This project was built in the sixties to provide an industrial water supply with the expectation that industrial customers would arrive to use the water and more importantly to pay for it. But the industry never arrived and the citizens of Aberdeen, the local sponsors, were faced with a million dollars a year repayment before the Representative from the district obtained a 10 year moratorium until 1983. First the government provides speculative water, then we are asked to provide speculative land. A Port Systems Study for Grays Harbor shows that much of its exports are in wood products and that much of this export capacity even with expansion lies unutilized. Where is the need for additional wetland fills?

Mediating environmental disputes among government agencies, while keeping citizens in an observer role is contrary to the policies of the Coastal Zone Management Act which calls for *participation* by the public in developing CZM programs. The Federal Office of Coastal Zone Management, the State Department of Ecology and the Estuary Task Force have deliberately

worked to exclude public participation. This policy is also being used in CZM planning in Minnesota, where citizens have gone on record protesting being locked out of the decision making.

Commenting on the major compromises listed, the agreement apparently reached for Management Area 13, the conditions placed on filling 500 acres of the Bowerman Basin for non-specific, non-water dependent uses are inadequate and clearly in violation of the 404(b)(1) guidelines. The Bowerman Basin, as one of the most biologically productive areas in the inner harbor and a critical area for shorebirds and waterfowl, has been proposed to the U.S. Fish & Wildlife Service for acquisition under their Unique Wildlife Ecosystem program. This report was unavailable at the time the draft estuary plan was released. To destroy an area of known biological importance for unknown non-water dependent development, flies in the face of every major wetland and wildlife protection policy this nation has developed.

The area the Port wishes to fill is an area currently designated *Conservancy* under the Grays Harbor Shoreline Master Program (developed under the State Shorelines Management Act). Transfer to a state agency of the remaining Port area is controversial and can be criticized on a number of grounds. Lance D. Wood and John R. Hill, both from the U.S. Army Corps of Engineers, in the *Coastal Zone Management Journal*, point out that ". . . any 'trade' of public control of some lands in return for a permit to dredge or fill in other wetlands must be conducted very carefully, since some wetland areas are much more valuable to the public than others are . . . the real value of a developer's 'committing wetlands to the public' can be questioned. If a developer buys legal title to wetlands and transfers title to a state or local government, or to a conservation organization like the Nature Conservancy, the transfer of title in itself would not necessarily safeguard the wetlands for long . . . state or local government that receives title to 'mitigation wetlands' might later develop those wetlands."[1]

Bankline straightening or bankline erosion control should not be permitted outside designated development areas. This type of conditional use, which permeates the plan, is simply one more instance of wetland alteration allowed in the estuary for unspecific purposes.

We note that at least in the draft plan, the relocation of Bowerman Airport, which borders the navigation channel, is a *definite* feature of the plan. OCZM and the Task Force appear to be backing out of this commitment. We continue to believe that relocation of Bowerman Airport, a Port owned and operated operation which lost the Port nearly $45,000 last year, would provide them with adequate land for water-dependent uses. If the airport is not relocated, then that to us is an indication that the Port feels safer with a losing proposition than with risking their best location in the hopes of attracting water dependent users.

The procedural issues are again indicative of the unimaginative approach OCZM has taken to the planning process. There is no question that citizen and interest group involvement in the plan formulation was and remains inadequate. There has been no attempt made by the Estuary Task Force to keep in contact with citizen groups. Citizens who did attend Task Force meetings were specifically told their input was not welcome. Citizen involvement is so basic to the success of CZM planning that unless immediate changes are seen in OCZM's attitude, legal challenges could tie up such plans for years. For OCZM to suggest that NEPA can be circumvented by agreement of federal, state and local agencies to decision making without the NEPA process will again subject OCZM to long and costly litigation. OCZM has made a mountain out of a molehill by their refusal to integrate NEPA, the FWPCA and CZMA.

An EIS should have accompanied the draft plan for the "special management area." Designations could have been made between areas for development and areas for protection, *based* on the FWPCA and specifically the 404(b)(1) guidelines. Then when a specific proposal comes up, a site specific EIS would be written to examine the environmental impacts and the alternatives available. This process assures some degree of predictability, while at the same time making clear that designation of an area as Urban or Urban Development does not mean a blank check to fill for any use that comes along. The latter is a principle clearly stated in the existing Grays Harbor Shoreline Master Program.

Therefore, no discretion would be surrendered by federal or state agencies over subsequent permit applications, rather a process is set up that allows a clearer understanding of what the federal and state requirements are, which must first be met, and in what areas the permitted uses might be assigned.

The substitution by OCZM of Estuary Planning for full review of alternatives for each permit application under the 404(b)(1) guidelines is bad policy and contrary to Sec. 307(f) of the CZM Act which expressly states that the FWPCA requirements "*shall be* the water pollution control . . . requirements applicable to such program." *OCZM's continued attempts to undermine the FWPCA is the single largest obstacle to resolution of a Grays Harbor Plan.* It is clear that the 404 guidelines are *not* met by the current Plan. Rather than pressuring EPA to rewrite the guidelines to suit OCZM, OCZM should adopt the above model and give EPA every cooperation to strengthen the 404(b)(1) guidelines to assure that our nation's wetlands do not suffer further from unwise dredge and fill activities.

The U.S. Army Corps of Engineers, and in our view rightly so, has refused to "formally adopt" the plan and has maintained that they will continue to carry out all their legal obligations of permit review. This is most important since the Corps regulations outline in detail the evaluation process on a site specific basis that must be carried out before a 404 permit is issued. These regulations state that the evaluation of every application must consider "the probable impact of each proposal in relation to the cumulative effect created by other existing and anticipated structure or work in the general area . . . the particular wetland site for which

an application is made will be evaluated with the recognition that it is part of a complete and interrelated wetland area." The Corps must also consult with other federal and state agencies to "assess the cumulative effect of activities in such areas." Furthermore, the Corps can condition permits to mitigate damage done, a feature excluded from the draft plan. If the Port of Grays Harbor can succeed in obtaining 500 acres of wetlands for non-water dependent uses, what will coastal zone planning bring us in Louisiana, New Jersey or Alaska?

It is our belief that a long range plan, with the proper constraints would tend to prevent further unplanned losses of wetlands due to political intervention. The current plan does not meet this test. Non-water dependent uses are *not* sufficient justification for filling wetlands. The city of Aberdeen recently pushed through a wetland permit for a restaurant, motel and parking lot. In the face of such ill-conceived planning for wetland uses, it is impossible to believe that further wetland losses for true water dependent uses would not take place. The proposed immediate filling of 250 acres for Port development cannot be authorized in advance of a permit application specifying the use and we will oppose such a policy in this and any subsequent CZM plan.

The adequacy of environmental data is not an issue. The question at hand is whether that data was adequately used in the decision making. There is ample evidence that it was not, especially as it concerns the Bowerman Basin. A more fundamental issue here is whether or not resource agencies, without citizen help and support, can adequately protect the public interest.

Finally, the limitation of the estuary planning boundary is a critical shortcoming. Without inclusion of the entire watershed, the estuary as an ecosystem cannot be considered. CZM planning can succeed, but only if OCZM exhibits an interest in the purposes of the CZM Act to *preserve* the land and water resources of the coastal zone in administrating its program. We cannot afford to sacrifice existing wetland policy to speculative port development in the name of CZM planning.

[1]Vol. 4, No. 4, 1978.

THE SEARCH FOR PREDICTABILITY - Planning and Conflict Resolution In Gray Harbor, Washington, Chapter 3: "Impetus For Task Force Formation," Washington Sea Grant Technical Report WSG 80-5, October 1980.

3 IMPETUS FOR TASK FORCE FORMATION

A number of factors provided the impetus for the development of an estuary-wide management plan in Grays Harbor. First of all, the geographic, socioeconomic, and governmental characteristics of Grays Harbor made it a prime candidate for successful regional planning. Secondly, Grays Harbor already had a tradition of interagency planning before the Task Force was formed. Thirdly, the navigation channel maintenance project and the potential channel improvement project result in dredged materials that could be used as free fill material to create usable development land in wetland and intertidal areas. The Port of Grays Harbor, in particular, wanted a plan that would specify sites to receive dredged material. Finally, the existing estuary management framework was inadequate and a great deal of frustration was engendered by attempts to manage development and conservation in the estuary using the existing procedures. Several key disputes erupted as a result of this inadequacy and served as catalysts to plan development. The following discussion examines in more detail these four factors which gave impetus to the planning effort.

Regional Homogeneity Conducive to Planning

The geographic, socioeconomic, and governmental characteristics of Grays Harbor predispose it to successful regional planning. Although there are numberous cities and towns with special interests, there is considerable homogeneity in the region, which distinguishes it from a number of other areas facing similar management problems. The entire estuary lies within a single county; there is only one port district, and its jurisdiction is countywide; and the regional economy is predominantly dependent on a single resource--timber. As stated in chapter 2, about 90 percent of the land in the county is committed to timber-related industries. Also, the Port of Grays Harbor uses its shipping facilities almost exclusively for the export of timber-related products.

This homogeneity should simplify comprehensive regional planning. Fewer actors are involved, and there is no competition among different port authorities or multiple county governments, as is the case in many other estuarine regions. For example, San Franscisco Bay and Puget Sound contain numerous cities, counties, and port authorities, and support a highly diverse set of uses. Estuary planning in these areas would be significantly more complex than in Grays Harbor.

Interagency Planning Tradition

Regional interagency planning activities are not new to Grays Harbor. Regional planning has been conducted under the auspices of the Grays Harbor Regional Planning Commission (GHRPC) and the Army Corps of Engineers (COE). Because of the frequent use of interagency planning in the last two decades, a tradition had developed which was followed when a new set of problems arose in the estuary in 1974 and 1975.

The GHRPC was formed in 1960 as a result of the Washington State Planning Enabling Act (RCW 36.80). The Commission is funded from state and federal sources and functions as a clearinghouse for social, economic, and environmental information. The GHRPC uses this information to facilitate a regional approach to water supply, solid-waste management, transportation, comprehensive zoning, and economic development in general. Although the GHRPC has no official authority

to make development decisions, it has demonstrated its ability to influence county and municipal policies and decision making through data organization and directed studies.

In the early 1960s, Grays Harbor County became the first county in the state to formulate a countywide comprehensive zoning plan. The GHRPC played a primary role in establishing this plan and provided support for municipally generated zoning ordinances. Also beginning in the 1960s, the GHRPC initiated a series of Overall Economic Development Program publications as an element of regional comprehensive planning. The fifth edition was completed in June 1979 (GHRPC, 1979). Supported by federal redevelopment funds, each edition functions as a review of current regional economic conditions and focuses on the formulation of particular development goals intended to further economic diversification, resource development, and environmental improvement. An economic development committee, with regional membership, guides the creation of economic development goals and objectives.

In the early 1970s, the GHRPC took the initiative to develop the first county-wide Shoreline Master Program (SMP) in the state. The SMP was developed with the cooperation of local governments in the region, who subsequently used the county's plan as a model in the development of city SMP's.

The COE has been a primary influence in the development of Grays Harbor, and was an early advocate of interagency environmental planning for the estuary. Beginning in the late 1960s and increasing in intensity in the early 1970s, uncertainty over the environmental effects of maintenance dredging and the disposal of dredged material in Grays Harbor developed among public groups and resource management agencies.

The first overture for interagency collaboration in the COE's long-range maintenance dredging planning program came in 1968. In addition to the COE as project sponsor, participating agencies were: the U. S. Fish and Wildlife Service (USFWS); Bureau of Commercial Fisheries (predecessor of the National Marine Fisheries Service); Federal Water Pollution Control Administration (predecessor of the Environmental Protection Agency); Washington State Departments of Fisheries, Game, and Natural Resources; and the Washington Water Pollution Control Commission (predecessor of the Department of Ecology). The product of this mutual planning effort was an agreement stipulating the scheduling of dredging in the upper harbor to avoid seasonal low river flow conditions when dredging would cause water quality degradation.

In 1972, with the strong support of the state, the COE gathered a similar cast of participants to plan the conduct of maintenance dredging in the estuary. The federal agencies reached an agreement but, in recognition of recent federal and state legislation increasing the role of state and local governments in shoreline planning and developments, they decided to include these entities in the long-range planning program. In June 1973, a conference of federal, state, and local representatives revealed significant questions and different points of view about the development requirements of the Grays Harbor region and the future health of estuarine resources. Pending resolution of these differences, the federal agency agreement was accepted as an interim program by state and local entities. A technical study was instituted to produce an adequate environmental data base for effective long-range planning.

When the technical study was completed early in 1977, the COE asked federal and state resource management agencies, the Port of Grays Harbor, and the GHRPC to participate in formulating an

estuary-wide, aquatic-area dredging plan. As explicitly stated at the outset, planning was to be within the framework of existing federal, state, and local policies, laws, and regulations. Particular emphasis was placed on integrating guidelines controlling dredge and fill activities with state and local shoreline-use laws and programs (Weinmann & Malek, 1978). Although a long-range plan has not yet been published or submitted for general public review, the program proposes a flexible system for mutual decision making among regulatory, management, and development entities. Thus, the COE played an important role in establishing interagency collaboration as a workable planning format in Grays Harbor.

Opportunity to Specify Fill Sites

In 1971, the Washington State Shoreline Management Act (SMA) required local governments to create Shoreline Master Programs (see appendix). In the Grays Harbor County SMP, 2,100 acres (840 ha) of Port-owned tidelands and wetlands are specifically designated as conservancy areas. This designation would prevent these wetlands from being filled and thus preclude industrial and commercial development. Why this program, which severely limits development, was approved by the state without Port objection cannot be fully answered. The program may have been approved because (1) it was the first local program in the state scheduled to receive approval by the Washington Department of Ecology (WDOE), and thus a certain degree of inexperience prevailed; and (2) the conservancy designation was, under certain conditions, allowed to accommodate some kinds of development.

It may be that Port officials did not strenuously object to the restrictive plan because they were confident that, with Congressional approval of the improved navigation channel, conditional approval of filling and developing the tidelands could be obtained. The Port is responsible for providing disposal sites to receive volumes of dredged material resulting from maintenance of the present channel project. Based on its comprehensive plan (see p.10), the Port could present a well-substantiated case for creating industrial and commercial development sites. Such development would provide the local economy with a needed boost, and thus the local and state political pressures would seemingly be directed to grant conditional approval for filling the tidelands.

The combination of the Port's responsibility for providing dredged material sites, the annual availability of dredged material, the scarcity of usable flat land surrounding the estuary, and the fact that the Port owns a great deal of potentially usable tideland served as strong stimuli for active Port support for development of an estuary-wide comprehensive plan. Such a plan could predesignate sites to receive fill for creation of industrial sites, and the Port could be assured that filling of at least some of its tideland holdings would be allowed.

Inadequacy of Existing Management Framework

As shown above, Grays Harbor has had an extensive planning and management framework for some years. A detailed discussion of the existing local and state coastal management programs, state environmental legislation and regulatory agencies, and federal environmental legislation and implementing agencies is provided in the appendix. This complex web of decision-making authorities, with overlapping project review responsibilities and sometimes conflicting review standards, created an atmosphere of confusion and frustration in

Grays Harbor prior to the initiation of the Grays Harbor Estuary Management Program and was a primary impetus for the formation of the Task Force.

Resource management and protection agencies, such as the state and federal agencies responsible for fish and game, play a primary role in review of development proposals. These agencies exercise permit review powers over development proposals to ensure the long-term environmental health of the estuary. Although these agencies often articulated contrasting perspectives and cited differing legislative mandates, they were in general agreement that (1) ecological and resource values must be preserved and protected for the future; (2) the amount of development the estuary could absorb while retaining its environmental viability is unknown, but limited; and (3) case-by-case permit review results in uncertainty over the cumulative effect of development and risks piecemeal disruption of estuarine resource properties. Technically, it is difficult for resource management personnel to document the ecological importance of the loss of a particular expanse of salt marsh at a particular point in time. Yet; their knowledge of estuarine ecology and their observations of changes over time in the estuary led them to conclude that incremental shoreline development activities were leading to significant adverse environmental effects in Grays Harbor.

Economic interests in the estuary want timely and predictable responses from government agencies to project proposals. Aquatic and wetland areas owned by development interests are valuable industrial and commercial property. Without the addition of fill or elevation of aquatic margins to upland grades, tideland owners may not obtain the full commerical value of their property. Whenever resource agencies impose limitations on the use of private land, and these limitations are unaccompanied by specific, technical criteria and are supported only as a protection of valuable natural resources, frustrated opposition ensues. Resource agencies maintain that the benefits from preservation and conservation are in the long-term public interest. In contrast, development interests maintain that the cost is not borne by the public when aquatic areas and tidelands cannot be developed. In effect, advocates of economic development agree that adhering to agency restrictions leaves them with an uncertain future, property with decreased commercial value, and violated personal property rights.

Local governments in Grays Harbor, although not always directly involved as project sponsors, began to feel that state and federal decision-making policies were interfering with their efforts to diversify and stabilize the regional economy. They considered the legislative concepts and administrative frameworks required by state and federal law to be time consuming and cumbersome. Private interests and local governments felt that their efforts as advocates of regional benefit through the use of estuarine resources were being subjected to highly generalized, and often arbitrary, decision criteria for the benefit of state and national interests at the expense of the residents of Grays Harbor.

Given these conflicting interests, disputes over the regional benefits to be gained from industrial development versus the potential environmental disturbance resulting from physical development activities were inevitable. The disputes were intense and resulted in a great deal of tension between development and conservation interests, and among public management agencies with regulatory responsibilities. The cities and the Port were the prime

local actors concerned with the development projects. State agencies involved in the disputes were the Washington Departments of Ecology, Fisheries, Game, and Natural Resources (WDOE, WDF, WDG, and WDNR), and the federal agencies involved were the COE, the Environmental Protection Agency(EPA), the U. S. Fish and Wildlife Service (USFWS), and the National Marine Fisheries Service (NMFS). Several key disputes are presented here to illustrate the conflict and the frustrating process of project review.

Key Disputes in Grays Harbor

Three key disputes between development interests and resource management and protection agencies in Grays Harbor were sufficient to catalyze demands for comprehensive environmental planning in the estuary. The first example demonstrates local and state coordination difficulties, while the latter two instances illustrate the interaction of development interests with all levels of government with decision-making authority in Grays Harbor.

Thunderbird Motel proposal The City of Aberdeen submitted a draft SMP to the Washington Department of Ecology (WDOE) in June 1974. WDOE had not evaluated or approved Aberdeen's SMP when the city received and approved a substantial development permit application for construction of a Thunderbird motel, restaurant, and marina complex along 1,200 feet (372 m) of shoreline near the confluence of the Chehalis and Wishkah Rivers in the eastern reaches of Grays Harbor (see fig. 2). Aberdeen determined that the project proposal, situated on a vacant site formerly occupied by a wood-products

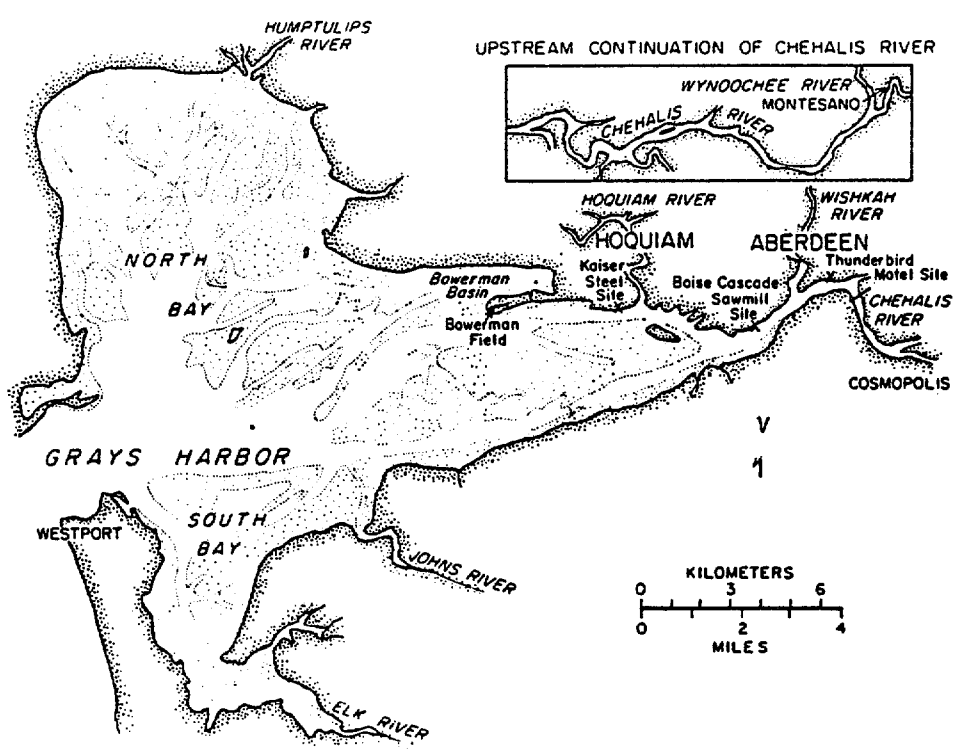


Figure 2 Sites of key permit-issue disputes.

facility and owned by the Port of Grays Harbor, was a reasonable and appropriate use and that project plans would generally enhance the area and benefit the public. The site was designated as "urban" in Aberdeen's draft SMP and adjoined an upland area zoned "commercial," which permitted commercial and light industrial activities.

In accordance with the SMA, the approved substantial development permit was forwarded to WDOE for review. WDOE did not concur with local approval, noting that the proposal was not in consonance with sections of Aberdeen's draft SMP dealing with restoration, public access, and development policies relating to water dependency. Further, WDOE determined that, in compliance with the provisions of the State Environmental Protection Act (SEPA), an environmental impact statement must accompany the proposal. Neither Aberdeen nor the project sponsor had prepared an EIS or the alternative, a statement of negative impact.

After WDOE rejected the proposal, development sponsors appealed to the judgement of the Shoreline Hearings Board (SHB #162, 1978). The state board concluded that the appellants did not comply with the SEPA guidelines and that this alone mandated WDOE's remand of the matter for reevaluation. The board made additional comments, noting that (1) although the project generally incorporated the provisions of the SMA regarding substantial development permits, the proposal did not closely follow the development policies stated in Aberdeen's draft SMP; and (2) the draft SMP did not appear to parallel state policies relating to navigation, commerce, and protection of estuarine resources, especially regarding landfills.

As a result, the project sponsor abandoned the proposal, while Aberdeen voiced irritation that a potential commercial venture and use of privately held land and shoreline had been discouraged by the state. The City of Aberdeen was particularly frustrated because they believed the project had conformed with the draft SMP. A shoreline permit was eventually obtained, although no EIS was prepared. The COE issued the permit over strenuous objections by the environmental community that the use was not water dependent, and that the COE and the permittee refused to mitigate the activity by removing the structure upland to avoid bulkhead filling.

The Aberdeen SMP was finally approved in June 1975 after amendments concerning landfills had been incorporated by the city. WDOE approval was accompanied by comment that the SMP did not squarely address complex issues relating to landfills and the expected uses of filled areas. WDOE referred to the proposed long-range dredging effects study sponsored by the COE as providing future clarification of this issue.

Boise Cascade Corporation sawmill proposal In October 1973, the Boise Cascade Corporation submitted a substantial development permit proposal to the city of Aberdeen. Boise Cascade proposed placing 1,348 feet (414 m) of bulkhead along the northern margin of the Chehalis River opposite the Aberdeen Reach of the main navigation channel (see fig. 2), and filling the bulkhead with wood-waste materials to provide level terrain for log storage and sorting.

Local authorities approved the project proposal. In November, however, WDOE appealed the proposal through its substantial-development review capacity because of potential water-quality impacts from wood-waste leachate. The appeal was based on guidelines restricting placement of wood-waste fill in shoreline areas. The permit was eventually granted by the state in late 1975, after it was

agreed that dredged material from the COE channel maintenance project would be used for the bulkhead fill in place of wood waste.

Obtaining a federal permit decision for the Boise Cascade project proved more difficult, and brought the need for comprehensive planning in the estuary to the attention of the state's two senators. In 1973, EPA had not codified criteria implementing section 404 of the Clean Water Act (CWA). Consequently, EPA centered its opposition to the project on water-quality criteria alone. The EPA was concerned about the long-term effects of wood leachates entering the estuary. However, after the proposed fill material was changed to dredged material, EPA retracted its objections. NMFS conditionally approved the project based on policies for protection of aquatic resources and water-quality guidelines. The remaining federal agency, USFWS, opposed the project due to expected adverse effects on fish and wildlife. USFWS noted specific impacts on (1) juvenile anadromous fish migrating through the proposed project area; (2) juvenile salmonid food supply that would be significantly altered by the fill; (3) shorebird and waterfowl use of the adjacent affected area for feeding and resting; (4) other specific impacts related to the use of wood waste for fill material; and (5) former deposition of wood waste in wetlands and tidelands in the Aberdeen area. Moreover, the USFWS response addressed the need for comprehensive estuarine planning, stating that they:

> . . .urged development of a comprehensive land use plan for this area to identify spoil sites and water oriented industrial needs. Until such a coordinated plan has been developed to establish a requirement for additional waterfront log storage area, we cannot accept the losses that such projects engender for fish and wildlife resources. We thus recommend denial of this permit (USFWS, 1974).

In a letter to the project sponsor, USFWS indicated similar concerns. The agency emphasized that "piecemeal and indiscriminate filling and construction" is chronic in the Grays Harbor region, and reiterated the desire for a comprehensive plan: ". . .we do, and will continue to, recommend that all such projects be denied pending development of a comprehensive plan, or at least until solid progress on a jointly developed plan is evidenced" (USFWS, 1974). Even after the nature of the fill material was changed from wood waste to dredged material, the site was designated for the water-related requirements of a sawmill, and the other involved agencies approved the proposal, USFWS continued to oppose the project.

The City of Aberdeen charged the Department of the Interior and USFWS with placing "a moratorium on development in the City of Aberdeen without consulting the government of Aberdeen and without providing the people of Aberdeen a chance to be heard." Aberdeen considered such action to be "an abuse of governmental power." The response went on to state, "Your objections, without good reason, have had a damaging effect on the economy of Aberdeen when we have 12 percent unemployment" (City of Aberdeen, 1975). Copies of the letter were also sent U. S. Senators H. M. Jackson and W. G. Magnuson.

The USFWS provided detailed responses to inquiries from both senators. They informed Senator Jackson that they had previously communicated their position on tideland filling to the GHRPC, and that USFWS "was not unalterably opposed to the project, but recommended denial of permits for fill projects until such time as a proper comprehensive plan is offered." The agency also took

exception to Aberdeen's charges regarding a moratorium on development:

> This is inaccurate. If our position may be termed a moratorium, it is a short-term moratorium on certain kinds of developments, such as tideland fill for all of Grays Harbor. This is done for the purpose of reaching a jointly determined plan that will accommodate our shared interests in the future management of the estuary (USFWS, 1975 a).

The response to Senator Magnuson was similar, but also stated:

> There is definite need for some kind of balancing action in this area. We realize port areas are primarily industrial zones; but to condone the continued piecemeal filling of valuable littoral areas for nonwater-dependent facilities and the resultant loss of fish and wildlife habitat without guarantee that the more valuable tidal and wetland areas will be preserved. . .is shortsighted and inconsistent (USFWS, 1975 b).

On 4 September 1975, the USFWS, Boise Cascade Corporation, the Port of Grays Harbor, and the GHRPC met in Aberdeen in an attempt to resolve the permit conflict. Boise Cascade indicated serious reservations about continuing the proposed project. On 18 September 1975, USFWS released its objection to the issuance of a COE section 10 permit:

> In the belief that good faith has been shown with respect to prompt action on a memorandum of understanding for joint development of a mutually acceptable comprehensive plan and with the full expectation that the City of Aberdeen and other local governments adjoining Grays Harbor will cooperate to the end that such a plan is developed in conjunction with federal navigation projects, it is our intention to withdraw our objections to issuance of the Boise Cascade Corporation permit (USFWS, 1975).

The agency stated, however, that it would object to any future filling activity involving wetland areas where a federal permit was required unless USFWS and appropriate local governments signed a memorandum of understanding relating to development of a comprehensive plan. The permit was finally issued after significant political intervention and a delay of nearly two years.

Kaiser Steel Corporation industrial facility proposal Perhaps the most pivotal dispute over estuarine resource use in recent years began with a permit application published by the COE on 31 March, 1975. An area at the mouth of the Hoquiam River (see fig. 2) had been obtained by the Port of Grays Harbor in 1963 as an industrial development district and was zoned "industrial" in the City of Hoquiam's comprehensive land-use plan. Hoquiam's SMP classified the site as "urban development." Therefore, local interests considered industrial use of the plot appropriate. The 44.5 acre (18 ha) site included approximately 25 acres (10 ha) of sedge-marsh habitat and 13.8 acres (5.6 ha) of tidelands (the remaining 5.5 acres [2.2 ha] was of upland grade), thus requiring the issuance of a combined federal permit to satisy section 10 of the Rivers and Harbors Act and section 404 of the Clean Water Act. An impervious dike, enclosing 3,355 feet (1,023 m) of shoreline, was included in the project proposal, with a total of 456,000 cubic yards (351,000 m^3) of fill material required to raise the grade of the entire site above the 100-year flood plain.

The Port of Grays Harbor, as project sponsor, stated that the fill was for log and lumber sorting and storage yards. Federal agencies responded as required by law. However, there was considerably more weight to certain review statements than in the past, particularly those of EPA. That agency had recently published proposed guidelines for implementation of section 404 (b) of the CWA. The guidelines emphasized project alternatives, and EPA stated that destruction of tidelands and associated wetlands warranted a critical evaluation of all reasonable alternatives to the fill of estuarine margins. EPA also expressed concerns about potential water-quality impacts of the proposed project; the fill material was to come from a submerged borrow site, thus increasing the likelihood of adverse affects on aquatic systems. EPA therefore recommended that the permit be denied.

The USFWS responded in depth to the Port's proposal, relating a list of project-linked impacts and the absence of comprehensive estuary planning necessary to avoid regional cumulative environmental disruption. The response reiterated the now-familiar position of USFWS:

> Past piecemeal development along the channel has decimated fish and wildlife habitat and drastically limited public access and fish and wildlife related uses. This is essentially the last remaining area that has the potential for becoming a waterfront park, providing public access to the waterfront, or being dedicated as open space. We believe the failure to consider this location for such uses is shortsighted and does not constitute waterfront planning in a comprehensive and coordinated manner (USFWS, 1975 c).

USFWS also stated that the use planned for the fill area was inappropriate because it was non-water dependent, and that alternative log storage sites existed elsewhere. USFWS requested that the permit be denied, and further stated that:

> . . . we have not abandoned our original objectives that there be coordinated and comprehensive site specific planning for the Grays Harbor estuary, its shorelines and wise waterfront utilization. We remain available. . .(USFWS, 1975 c).

NMFS objected to the permit, concurring with EPA that adverse water-quality impacts would significantly affect aquatic resources.

After all federal agencies recorded opposition to the proposed log storage and sorting project, events took an unexpected turn. On 24 June 1975, the EPA received a letter from Senator Jackson stating, "I have learned that the land in question, for which a permit must be obtained from the Corps of Engineers, is intended to be used by a firm which constructs equipment designed to increase energy production in this country" (Jackson, 1975). Apparently the Port had confidential development plans for the site. Specifically, the Port had been privately negotiating with Kaiser Steel Corporation for an energy-related industrial facility.

On 17 July 1975, EPA and USFWS personnel met with Port of Grays Harbor officials and were informed that on 22 July 1975, a lease option for the site would be signed with Kaiser Steel Corporation. This firm, it was revealed, would manufacture and assemble off-shore drilling platforms for exploration and exploitation of oil and natural gas deposits on the continental shelf of North America.

On 17 September 1975, the Port made appropriate revisions to the SMA permit application reflecting the proposed Kaiser Steel facility and identifying Kaiser as a project co-sponsor. The use change from log sorting and storage to the fabrication of off-shore drilling

equipment also necessitated a revised COE permit application and thus reevaluation by all agencies.

In September 1975, EPA's proposed interim final section 404 guidelines were promulgated, and construction of the Kaiser Steel facility appeared to meet the agency's criteria. The Port and Kaiser Steel, however, had not yet finalized a lease agreement. As previously noted, many of EPA's original water-quality concerns with this project were due to the source of the proposed fill material. To overcome this objection to the project, the Port, Kaiser Steel, and the COE initiated discussions to coordinate the spring 1976 maintenance dredging schedule with the filling of the Kaiser Steel and Boise Cascade sites so that dredged material could be used for fill. EPA recognized the adverse water-quality impacts caused by filling the wetland area, but noted that impacts would be minimized if dredged material were used. As the project would aid energy production and was considered to be in the national interest, and since it appeared to conform to their criteria for dredging and filling, EPA responded on 14 October 1975:

> If this agency withholds permit approval pending an actual Port of Grays Harbor and Kaiser Steel Corporation use agreement, the time needed for filling the site for this use may expire. The Port and the Aberdeen-Hoquiam area may lose this needed industry and employment. We will not, for this reason, hold up the issuance of the permit for the agreement (EPA, 1975).

As noted earlier, Kaiser Steel had merely committed to a lease option on the property. Concurrently, the availability of off-shore oil leases in the Gulf of Alaska became uncertain due to conflicts surrounding secondary impacts of oil development on coastal communities in Southeast Alaska. Furthermore, additional delay of the Kaiser Steel project seemed unavoidable since the COE had determined that a federal EIS would be required. EPA foresaw these potential problems and surmised that Kaiser Steel would probably never use the site. Therefore, EPA conditioned its response, citing 404 implementation guidelines, to require future dedication of the site for water-dependent use regardless of the ultimate occupant.

In an eleventh-hour effort to salvage the fill proposal and to retain Kaiser Steel as a lessee for its site, the Port of Grays Harbor formulated Resolution No. 1673 on 9 December 1975, (Port of G. H., 1975; USACOE, 1976 b & c). This resolution officially ". . .dedicates and pledges the use of this industrial site by water-dependent activities only, and be it further resolved, the Port of Grays Harbor pledges its continued cooperation in developing a comprehensive plan for the Grays Harbor estuary. . ." With the signing of this resolution, the remaining federal agencies conceded to the issuance of the COE permit.

The filled area west of the mouth of the Hoquiam River is vacant at present, since Kaiser Steel and the Port did not complete the final lease agreements. Development of off-shore oil resources in Alaska has not proceeded as rapidly as initially expected. Commercially developable oil reserves have not been discovered on the leased tracts. Off-shore oil and gas drilling equipment probably will be fabricated and assembled elsewhere. The vacant site remains controversial, however. The area is stabilized fastland and is available for use. Resource agencies hold that, if there is a pressing need for industrial development sites, as local interests and the Port assert, the site would be occupied at this time.

Decision-Making Problems at the Local Level

The three key disputes discussed above reflect general decision-making problems. One of these general problems centers on uncertainties in implementation of the SMA at the local level. Since the inception of the SMA in 1972, WDOE has reviewed all substantial shoreline development applications in the estuary (see appendix). WDOE records for the years 1972 to 1975 indicate that an overwhelming majority of project proposals were situated in the inner harbor area, thus requiring initial review by Grays Harbor County and the cities of Aberdeen and Hoquiam. Although the county SMP was first approved by the state in June 1974, WDOE reevaluated the program in September of that year. The state determined that the county SMP allowed "indiscriminate use of fill for all types of activities" and, as a result, was inconsistent with SMA implementation guidelines (WDOE, 1974). WDOE requested that Grays Harbor County amend and rewrite portions of the program such that "regulations for landfills and bulkheads. . . favor shoreline-dependent uses." The county SMP was not officially approved until July 1978 after specific WDOE suggestions had been incorporated. The Aberdeen SMP was finalized in June 1975, but, as noted above, it contained fundamental inconsistencies with state water-dependency policy guidelines. Hoquiam's SMP was accepted by WDOE in April 1976.

Thus, estuarine resource-use disputes, preceding the agreement to enter into collaborative planning, had generally occurred in the absence of officially approved SMP's. A formalized coastal zone decision framework, as mandated by the state SMA and the federal CZMA, was not in place in Grays Harbor from 1972 to 1975, the period in which the three disputes discussed above created a common impetus for collaborative planning. During this three-year period, approximately fifty-five substantial development permits were administered by Aberdeen, Hoquiam, and the County. All of these were followed by state review. Of this total, only six projects were remanded by WDOE for reevaluation by local government. Five of the permit applications returned to local administrators for additional analysis were appealed to the Shorelines Hearing Board, including the three disputes described above. Although local SMP's were not functioning as formal devices for implementation of shoreline management in the estuary, only a small portion of project proposals were appealed to the Shorelines Hearing Board.

State criticism of local permits decisions centered on fill proposals, water-dependency criteria, and state environmental policy. As the local SMP's were installed, conflict in Grays Harbor was not being ameliorated. Furthermore, those involved in the use and permitting conflicts apparently did not expect the situation to improve with the forthcoming federal approval of the state Coastal Zone Management Program (CZMP) in June 1976.

Decision-Making Problems at the State and Federal Levels

At the state level, four agencies -- WDOE, WDF, WDG, and WDNR -- are important participants in estuarine resource-use determinations in Grays Harbor. Each has authority over aspects of shoreline and aquatic resource regulation and management, but their individual approaches differ. These four agencies also have differing sources of decision-making authority (see appendix). Authority for water-quality control has been delegated by the federal government to the WDOE under section 402 of the CWA. Both WDF and WDG are responsible for management of living aquatic resources, but have no specifically mandated authority

to protect estuarine shoreline or aquatic-area habitat, except in issuing a Hydraulics Project Plan Approval. However, both WDF and WDG have expanded their role in affecting the use of wetland and aquatic resources because they can influence the federal permit process (to be discussed below). WDNR, as a manager of state lands in the public interest, has established policies and guidelines for the management of state-owned aquatic areas. WDNR use policies address navigation and commerce; public use; food, mineral, and chemical production; uses of aquatic areas by abutting land owners; and revenue production.

Differing sources of decision-making responsibility and diverse approaches to management of specific estuarine resources make for potentially fragmented review of project proposals by state agencies. For example, WDOE may respond to a particular proposal by noting water quality concerns. WDF, with primary interests in the direct use of aquatic areas by fish and shellfish, might agree with WDOE, especially if no irreversible loss to benthic or intertidal habitat is foreseen. WDG views development on estuarine margins in a different manner. If the proposed project would affect estuarine wetlands or marsh areas, WDG might resist project approval owing to its more broadly based objectives, which include habitat maintenance. WDNR's position might support approval or denial, depending on the proposed project's proximity to established harbor lines or state owned tidelands or the perceived need for upland access. Thus, agencies responding to different aspects of a proposal, with potentially contrasting criteria and objectives, may not only confuse the project sponsor, but generate concern among the agencies themselves over the state's overall ability to manage estuarine resources for the long-term public benefit and protection of the estuary's viability.

The federal resource agencies have perspectives similar to those of state agencies with authority over the same resources. USFWS, like WDG, has a primary interest in wildlife and its habitat; NMFS, like WDF, has a primary interest in fish and shellfish; and EPA, like WDOE, is primarily concerned with water quality in the estuary. Also like the state agencies, the federal agencies' fundamental concern is for the adverse environmental effects of filling estuarine tidelands and wetlands.

At the federal level, the COE, EPA, USFWS, and NMFS share responsibility for review of proposed estuarine development projects. While the COE actually issues section 10 and section 404 permits, in the latter case they must apply criteria developed by EPA, and specific COE decisions can be vetoed by EPA. Moreover, the authority of both these federal entities is subject to review and evaluation by other federal and state resource agencies, stemming from the broad requirements for decision making set forth in the Fish and Wildlife Coordination Act (FWCA) and the National Environmental Policy Act (NEPA). Thus, USFWS, NMFS, and concerned state resource agencies provide comment and can influence section 10/404 determinations. In theory, this multiagency review should result in a comprehensive analysis and decision, since COE expertise lies chiefly in section 10 matters, USFWS and NMFS have extensive experience in management of specific aquatic resources and wetland habitats, and EPA concentrates on water quality. However, fragmented decision making may also result.

Another potential problem area in federal agency decision making concerns the alternatives analysis required under NEPA, CWA, and FWCA. In particular, analysis of alternatives to wetland fill is central to the joint EPA/COE guidelines to implement section 404 of the CWA. Alternatives must be determined for each proposed shoreline or aquatic-area project, with analysis and evaluation dependent upon

the specific nature of the proposed activity as it relates to wetland resources. The various federal agencies may differ in their evaluation of the proposed alternatives. Thus, although the proposed joint 404 guidelines establish agency responsibilities for review of the specific environmental effects expected from development proposals, the agencies could still differ among themselves on the preferred outcome.

Given all these difficulties in coordinating local, state, and federal decision making, case-specific disputes similar to those over the Thunderbird Motel, Boise-Cascade, and Kaiser Steel proposals were expected to continue and increase in frequency. All interests and actors were dissatisfied. Dredging and filling activities were likely to be continuous and the decision-making system offered little relief to developers or resource agencies. By the mid-1970's, all parties were, therefore, ready to participate in a Grays Harbor Estuary Management Program.

APPENDIX E

EXCERPTS FROM THE FEDERAL COASTAL PROGRAM REVIEW*

* Source: Office of Ocean and Coastal Resource Management
National Oceanic and Atmospheric Administration
Department of Commerce

III. PROBLEMS OF THE EXISTING REGULATORY SYSTEM

This section of the chapter discusses the evolution of the Federal and state environmental regulatory process during the last two decades, the typical types of conflicts generated by multi-agency review of development proposals, and the kinds of generic problems created by such review

A. Recent Evolution of the Regulatory Process

An important result of increased environmental awareness and concern during the 1960s was a flurry of legislative activity at both state and national levels, and judicial challenges that changed the way in which some existing laws were administered. Congress passed a number of laws that set standards and procedures for meeting national air and water quality requirements, and gave new authority to Federal agencies to implement them. Other Federal assistance programs were designed to encourage states to develop their own regulatory programs; states were encouraged to pass laws involving state agencies in regulating development in wetlands, beaches, and other sensitive natural areas that had historically been managed by local governments. In addition, laws were passed to assure full consideration of environmental values and fish and wildlife resources in Federal decisionmaking processes. Most of these new state and Federal laws and court decisions expanded the rights of citizens and interest groups to influence and participate in the regulatory process.

While these changes dramatically increased protection for valuable coastal resources, the systems for managing coastal development also became pluralistic, complex and costly. Development that once had been controlled primarily by local government through local planning and zoning permits, or not controlled at all, is now influenced by numerous Federal, state and local agencies, each with their own permits or separate review requirements. Developers and citizens are now faced with, not only the planning and zoning controls of local government, but also numerous single purpose performance standard programs, each requiring several reviews and permits. For example, routine dredging applications in San Francisco Bay typically require the review of five state agencies and four Federal agencies, in addition to the agencies of the local jurisdiction involved. According to local officials, over 700 permits were needed for construction and operation of the SOHIO oil port and transshipment facility in the Port of Long Beach. The company spent nearly $60 million on the development of this project prior to the withdrawal of its applications in 1979.

In spite of this complexity, the large majority of coastal development projects are approved. Many permits are conditioned to meet the requirements of state, local and Federal laws, but these conditions are seldom so onerous that projects cannot be completed. The conditions can involve added costs that must be balanced against public benefits of improved project design. For example, during the 4 years that the

California Coastal Commission approved permits for all coastal development under Proposition 20, 97 percent of more than 25,000 development proposals were approved. During the last 2 1/2 years of administering the Massachusetts Wetlands Protection Act, the state's Division of Wetlands reports that less than 10 percent of wetlands orders by local conservation commissions were appealed. At the national level, the Corps of Engineers reports that in Fiscal Year 1979 less than 1 percent of all permit applications were referred to its Washington headquarters for resolution of conflicts. Of the 16,000 permits or letters of permission processed by the Corps in that year, 72 percent were approved with no problems, and most of the remainder were handled at the district level.

Although these statistics do not reflect the costs incurred by those who withdraw applications prior to completion of the regulatory process due to delay, unacceptable conditions, or general frustration with the uncertainty of the outcome; the proportion of permit applications that raise significant problems of interagency conflict or coordination is very small, in comparison to those that are approved with no conflicts. The small percentage of permit actions that involve denials, appeals or conflict are typically larger projects which have a greater potential for significant impacts on natural resources or economic development. Conflicts over these projects can take large amounts of time and money for environmental analysis, litigation, administrative appeals, dispute resolution and other results of conflict and delay. However, it is recognized that in some cases conflicts between agencies with different mandates serve to identify and protect the overall public interest, and these expenditures are worthwhile.

B. Conflicts Generated by Multi-Agency Review

The pluralistic system of regulatory review that has developed over the last two decades has, however, contributed to protracted disputes in some instances and has led to the need for increased coordination among Federal, state and local agencies. A typical conflict situation may involve a developer, port authority, or public works agency that reaches agreement with one or more local governments on a proposed project, only to have the project denied after lengthy and costly proceedings by a state or Federal agency. In some cases both local and state approvals may be granted, but a Federal permitting agency may deny the project on the basis of its own requirements, other Federal agency comments or those from citizens or interest groups.

Such conflicts can occur within a single level of government. For example, local development projects which are proposed in order to carry out plans supported or approved by one Federal agency may subsequently be denied by another Federal regulatory agency. A state or local government may have invested considerable time and money in preparing a comprehensive land use plan, airport or highway plan, or economic development plan with Federal funding agency assistance and concurrence -- only to have projects needed to implement the plan blocked by a Federal regulatory agency that did not participate in such plans. State or

Federal resource agencies may also disagree among themselves on how projects should be developed. Several classic examples of such conflicts were cited by an agency official providing comments for this Review:

> "A water quality agency, in its review of a permit for a shoreline development, required that it be constructed on fill that would seal off leachate from an old woodwaste disposal area. A wildlife agency refused to approve the permit because the fill would remove some wetland and required that the project be constructed on a structure. Either way was acceptable to the developer, but the two agencies did not agree. The proposal, caught in this delay, lost financing and fell through. In other situations, agencies responsible for waterfowl tend to support marsh creation projects while agencies managing fish will resist any modification in aquatic areas. This conflict often frustrates mitigation proposals (since mitigation proposals often benefit one species at the expense of another) and enhancement proposals. Controversies over mitigation or enhancement proposals can be as great as development proposals. This conflict between 'environmental protection' agencies is often very confusing to local officials and is perhaps their greatest frustration in dealing with agencies."

Conflicts such as these can delay or prevent needed economic development or energy projects, lead to loss of valuable coastal resources, or cause excessive costs to both private investors and the public. The Port of Baltimore, for example, maintains that its dredge disposal costs have increased 400 percent over the last 4 years because of delays in obtaining necessary Federal and state permits largely due to intergovernmental conflict and environmental litigation over spoil disposal on two nearby islands. Too often, such conflicts emerge from the process after specific sites have been selected, land acquired, local permits obtained, and large amounts of money invested in engineering drawings, site investigations and environmental analyses.

These kinds of conflicts are often resolved in a way that leads to frustration with government. The uncertainty of the outcome and difficulties of the regulatory process has a chilling effect on some citizens' willingness to engage in it at all. In other cases, developers and local proponents may try to overturn negative Federal agency decisions on a project by political intercession rather than seek a more appropriate location or produce a design that would meet the agencies' requirements. In Grays Harbor, Washington, for example, 39 acres of valuable tidelands were lost when state and Congressional legislators intervened in a conflict between the local Port Authority and state and Federal resource agencies over the filling of land for an oil platform construction facility. Four years later, the filled area remains vacant and unused. In Monterey, California, the famous Cannery Row was excised from the State Coastal Commission's jurisdiction by the state legislature when efforts to resolve conflicts between development and preservation interests broke down. Such political intercession may foreclose opportunities for citizens, interest groups or property owners to influence the outcome of

regulatory decisions, or, at the least, cause them to perceive that they have not had an equitable chance to do so. The perception that narrow special interests are often the beneficiaries of such intercession damages the credibility of the entire regulatory process.

C. Generic Problems

The existing regulatory system is largely reactive. It fails to anticipate potential conflicts and provide mechanisms for avoiding them, or to provide for a clear and unified framework of public policy to guide the balancing of public costs and benefits of individual agency decisions. As a result, the following generic types of problems continue, underlying many of the conflict situations described above:

1. Inconsistent government policies

Inconsistent government policies can lead to unnecessary conflicts when development proposals are reviewed. For example, if local government plans designate wetland areas for housing or other nonwater related uses on zoning maps, property owners and prospective developers may be falsely encouraged to propose development that is likely to be denied, since it may be the policy of a state coastal zone management program or Federal agencies to discourage such uses of wetlands. In Marco Island, Florida, for example, the Deltona Corporation received local zoning and state approvals for the proposed development of thousands of dwellings in wetland areas, only to have its proposals denied by Federal regulatory agencies. The Corporation incurred substantial losses in the lengthy battle over these plans.

Approval of a project proposal at the state or local level without adequate review of Federal requirements often puts additional pressure on Federal regulatory agencies to approve projects, especially those considered to serve the local or state public interest. For example, in states with approved coastal management programs, developers often misinterpret the Federal consistency provisions of the Coastal Zone Management Act as requiring Federal agencies to accommodate local or state desires to allow development that is allowed by the approved state program. The problems created by this lack of understanding of the limits of Federal consistency were described by one Federal agency representative participating in this review as follows:

> "On several occasions I have been present while developers, with local planners at their side, argue that since their development is consistent with the local Shoreline Master Plan, (the National Marine Fisheries Service) and (the Fish and Wildlife Service) must consent to (Corps of Engineers) permits. When they discover (the Coastal Zone Management Act) does not provide an automatic path through the permitting process, there is a sense of betrayal. They believe they had followed the proper procedures, and are surprised to discover that FWS guidelines can prohibit something approved in

their local program. Thus, it is frequently impossible for a developer acting in good faith to discuss a project with his local government and thereby get a complete picture of the regulatory hurdles he faces."

2. Uncertainty in the permit process

As a result of the "performance standard" approach to environmental regulation, most Federal permitting programs lack sufficiently specific policies to guide applicants. Federal regulations tend to mandate consideration of broad areas of concern, or require documentation of certain findings, but provide only very general statements of substantive policy that could guide specific planning decisions. Agencies rely only upon case-by-case review of development proposals, based on data collection and analysis of the specific proposed site and the detailed characteristics of the proposal. Even the broad planning considerations involved in projects, such as suitability and need at the proposed location, or consideration of alternative sites, typically are addressed only when an application for a permit is submitted.

Agency regulations typically set forth processes for making decisions that require consideration of alternatives, environmental impacts, or documentation of the need for development proposals. However, they do not provide specific substantive direction to administrators or the public on what documentation is sufficient, or even clear definitions of such matters as water dependency, mitigation requirements, or cumulative impacts. For example, Corps of Engineers' regulatory criteria, to be considered in the review of permits for dredging and spoil disposal, include factors such as "the relative extent of the public and private need for the proposed structure or work" and "the extent and performance of the beneficial and/or detrimental effects which the proposed structure or work may have on the public and private uses to which the area is suited." Because these criteria provide little substantive guidance, the Corps and other Federal agencies must develop more specific guidance tailored to specific projects or areas. For example, an association of property owners, with holdings adjacent to Belvedere Lagoon in California, attempted for more than two years to secure permits for dredging the Lagoon, permits that consultants said were necessary to preserve the Lagoon for fishing, swimming, boating and related recreational activities and to avoid future fish kills, mudflats, algae blooms and stagnation. After this delay, the Corps and EPA developed new technical criteria to determine whether the project would cause significant environmental impacts. Based on new tests using these more specific criteria, the Corps determined that the project complied with the general criteria.

Even in areas where national policies have been developed, they tend to be so general that administrators have almost unlimited discretion to interpret their meaning in the case of each permit application or plan. For example, Corps regulations provide that in determining whether a proposed alteration of wetlands is necessary, consideration must be given to whether or not the proposed activity for which the alteration is to be made is dependent on location in, or in close proximity to the aquatic environment. Because the concept of water dependency is not fully defined, each District

Engineer must interpret the criteria on their own, and this judgment may differ from that of other Corps officials and Federal and state agencies.

In contrast to the general procedural criteria of the Corps' regulations, EPA's revisions to regulations for Section 404(b)(1) of the Clean Water Act include significantly greater guidance with respect to determinations to be made in regional offices regarding discharge of dredged and fill materials in U.S. waters. For each area of concern, such as salinity or mud flats, EPA's proposed guidelines describe environmental characteristics and values, actions that might result in the loss of those values, guidelines for minimizing impacts, and other special considerations. These guidelines recognize that individual judgment must be exercised in each case, and do not prescribe quantified standards or thresholds by which every project or plan is to be judged; they do, however, provide an important measure of substantive guidance to field personnel regarding the standards by which such judgments are to be made. By law these two sets of regulations go together to control the discharge of dredged or fill materials under Section 404 permits issued by the COE.

Although the more general system allows permitting agencies to maintain maximum flexibility to consider all relevant factors and interests before making decisions, the uncertainty inherent in this approach can work against the interest of both applicants and conservation advocates. The risk of investments in development proposals is greatly affected by the predictability and timing of government regulatory decisions. Investors want to know what the policies and requirements are, where these apply geographically, how the agencies will make their decisions, and when they will receive answers. Uncertainty leads to greater costs for applicants in developing their proposals. Conservationists and other citizens also want to know what the agency's policies and requirements for development are, how these will affect valuable resources, and what parts of an area are to be protected from development over the long-term future. Property owners want to know how their neighborhoods are likely to change in the future so that their investments and quality of life are protected.

In addition, the uncertainties of the regulatory system have broader costs. As indicated above, they may lead to political intercession in specific decisions that undermines the public perception of the legitimacy of the governmental process. They also lead to intense frustrations with the process. As one commentor noted, "applicants are not mind readers." This reaction was articulated differently by another reviewer of this study, who claimed that applicants are forced to respond to repeated vague requests for project information or for the redesign of their projects until the personal expectations of the reviewer are met, causing considerable uncertainty, delay and added expense.

Finally, these uncertainties can also lead to inequities in the treatment of similar problems. For example, in a December 1977 study of the Corps of Engineers' regulatory program, the General Accounting Office reported that the Corps' "guidance for evaluating permit applications can be improved," and indicated that the Corps' headquarters should provide better guidelines and criteria to districts for evaluating permits

involving wetlands. GAO pointed out that of the five Corps districts it evaluated, each considered wetlands protection an objective of the Clean Water Act, Section 404 Program, but employed different methods to achieve that objective, and had quite different records of approvals and denials for similar actions involving wetlands. The report concluded that, "Differences in the application of wetlands protection measures caused unequal treatment of applicants desiring to perform work in wetlands areas."

3. Failure to address cumulative impacts

The cumulative impacts of multiple permit decisions often cannot be assessed adequately through the review of single applications. The long-term consequences of development in a given area are difficult to control through a case-by-case review of each project application. Protection of the natural functions of an ecosystem requires assessment of long-term cumulative impacts of many projects, not just those for which applications have been submitted. Balancing economic development and environmental concerns often requires that ecosystems be dealt with in their entirety.

For example, at the time a project is proposed, the natural interaction of various parts of an estuary, bay or watershed cannot be adequately considered when permitting agencies deal with only one application. In 1979, the Port of Coos Bay, Oregon, applied to local, state and Federal agencies for two permits -- one for a dock in the Bay's North Spit and another for a trawler basin associated with the dock. Both projects were part of the Port's long-range plan for industrializing an estuarine shoreline. Both also involved alteration of wetlands, a matter of considerable concern to the agencies involved because Coos Bay had lost 85 percent of its wetlands to fill since 1892. As a result of public and agency concerns about the impacts of the proposals, the Port withdrew its application for the trawler basin. This action left the agencies reviewing the application for the dock with an expectation of potential secondary or cumulative impacts of the dock proposal, but with no legal means to address those impacts, given the limitations of the dock application before them. The dock was ultimately approved with no mention of the broader implications of the project in the Corps' permit.

The 1977 GAO report on the Corps of Engineers' permitting program noted that, although the Corps' regulations require consideration of cumulative impacts, neither the regulations nor management directives specifically provide means for identifying and evaluating cumulative effects. This report indicated that an in-house Corps study in 1976 identified the evaluation of cumulative impacts of proposed works as a major district problem, due to the lack of methods or data to perform cumulative impact assessments. The Corps has recently responded to this need by requesting proposals from contractors to study the cumulative impact problem and to develop technical methods for cumulative impact assessment of permit activity.

4. The costs of case-by-case permit review

Case-by-case review of permit applications can involve excessive costs to applicants and the public. In many areas where development involves shoreline alteration, a number of state and Federal agencies review the same project proposals, and are concerned with the same or similar effects of these proposals on natural resources. Typically, the U.S. Fish and Wildlife Service, National Marine Fisheries Service and Environmental Protection Agency, as well as state fishery, wildlife, public lands, and water quality agencies, all review the applications for projects involving the discharge of dredged or fill material or wetland alteration. Each of these agencies may request or collect its own data, conduct a separate environmental analysis, and reach its own decision. In some cases, each of these agencies may collect and analyze data repeatedly for each permit application in the same area. Applicants for development in such areas may be required to submit information that has already been acquired by the agencies from previous applicants. Redundant, uncoordinated, and unpredictable agency data collection, analyses, and review procedures increase public taxes. Those who invest in property and development also bear added costs in the form of interest on borrowing, property taxes or option fees, professional fees and administrative expenses.

For example, before the Baltimore and Norfolk Districts of the Corps of Engineers revised their procedures for reviewing permit applications for dredging and fill in wetlands, the site of almost every proposed project was visited separately by the Fish and Wildlife Service or the National Marine Fisheries Service in these Districts as part of the application review. In the case of a proposed Corps harbor maintenance dredging project to serve a seafood processing plant on Maryland's Eastern Shore, the owner of the plant and the adjacent property where the dredged materials were to be disposed claimed that nearly 200 various government officials visited the site during the 6 years before the project was approved in 1979 (with conditions that minimized its environmental damage). A June 1980 GAO report on processing Corps permits for dredging projects indicated that overlapping roles and duplication of efforts were still contributing to permit delays. In the Corps' Districts it reviewed, both FWS and NMFS were receiving all public notices regarding dredging applications and often performing field reviews on the same project. Encouraging progress has been made by the COE in reducing this problem by development of interagency agreements and joint Federal-state review procedures, described in Section IV-A.

There are often substantial costs to natural resources associated with case-by-case review of completed project applications. Controversy or delay resulting from a wildlife agency objection to a project application, in which substantial investments may have been committed, often leads to political intercession on behalf of the applicant and loss of an environmental resource.

No complete estimate exists of the costs associated with redundancy, delays and conflicts resulting from a regulatory system that relies

primarily on case-by-case permit review. However, some of the comments received during this review suggest that the costs are substantial. These include the following:

- A port official noted that "A rule of thumb in the [port] industry is that delay alone [in regulatory proceedings] increases total project costs by 1 percent per month."

- The same official also noted that "There are also substantial environmental costs caused by delay. Millions of gallons of sewage have been dumped [into rivers and bays] during delays in getting agreement between agencies for waste water treatment system improvements."

- A conservation group indicated that "The Corps of Engineers spends $30 to $40 million per year on environmental impact studies, and millions more in litigation over their decisions. Tremendous cost savings could be realized by a new approach to these decisions...."

- A city official noted that "We spent between $130,000 and $150,000 producing a regional plan [to address regulatory conflicts] for the Baltimore Metropolitan Coastal Area. [By comparison,] the environmental assessment for one permit in this area cost $1.2 million. [For another example,] Bethlehem Steel Company claims that delays in obtaining permits cost an additional $500,000 to $1 million on recent construction projects in the area. I do not think you would have trouble attracting funds [for improving the regulatory system] from industry."

5. Misuse of case-by-case permit procedures

It is often alleged that there is a misuse of case-by-case permit procedures by those who wish to impede economic development, or by others who wish to circumvent sound requirements for environmental protection.

Those proposing projects frequently claim that permit review procedures provide too many opportunities for opponents of economic growth or new development to veto projects. They claim that information is withheld during the planning of projects, when it could be used to improve the project design; and then used against the project when the opponents' voices are most effective in the regulatory process, -- such as before administrators or commissions that are most responsive to environmental concerns. Project proponents often claim that since projects typically require several stages of approval through different agencies, they can be stopped by opponents by gaining cumulative concessions from agencies for conditions on projects by finding the "weak link" in the chain of regulatory decisions, by challenging projects in the court when opponents fail to get what they want in administrative procedures, or by so slowing the process with minor objections that the project becomes uneconomic. For example, late in the multi-year battle over Tellico Dam in Tennessee, environmental groups allegedly sought and found an endangered species -- the snail darter -- after failing to stop the project on

other grounds in the administrative proceedings. This led to Congressional intercession in the form of changes to the Endangered Species Act.

On the other side, citizens and environmental groups often claim that some public agencies view the public welfare too narrowly by reviewing projects in a manner that reflects only interests in business, economic development, taxes, or jobs and that environmental concerns are too often ignored. They claim that when legitimate environmental concerns or requirements are used to condition or deny development proposals, applicants often label the "bureaucratic permit process" as an arbitrary abuse of public authority, a taking of private property without compensation, or otherwise try to avoid complying with the law. They frequently allege that some development interests purposely avoid addressing environmental concerns through political intercession on projects or legislative challenges to legal requirements. Many coastal management laws have been challenged repeatedly in state legislatures on the basis of "horror stories" of delay or increased costs caused by regulatory procedures. For example, when Brown and Root withdrew a proposal in 1978 for an OCS platform fabrication facility near Astoria, Oregon, local officials and the press blamed state and Federal environmental permit procedures, particularly state mitigation requirements for wetland alterations. Later information revealed that while the agencies were working toward approval of the facility with conditions to safeguard the environment, the firm withdrew its proposal because the market was not favorable for its products in Alaska lease sale areas and antitrust actions had been commenced against its parent company.

Environmental and other public interest groups point out that proponents of projects are typically well-financed and have adequate legal representation for their private interests, while public groups have only limited (often volunteer) resources to participate in regulatory proceedings. This, they claim, accounts for those few situations when such groups avoid commenting in lower level (sometimes hostile) proceedings, in favor of commenting in later proceedings where they have the most influence. Citizen groups also claim that some developers purposely "wear down the opposition" by scheduling, then canceling, public hearings on proposals or making repeated minor revisions to proposals, and selecting an opportune time for processing applications when the initial controversy has subsided. However, small developers or private landowners often have less resources and expertise to use in this process than such "public" groups, and complain about the undue regulatory burden imposed by what they see as unrealistic zealots.

To some extent these generic types of problems of the existing regulatory systems are found wherever development is managed by government agencies with overlapping legal jurisdictions over the same projects or resources. However, they become intensified in the nation's coastal zone, which contains many limited geographic areas where unique and valuable natural functions that serve fish and wildlife resources compete with economic functions such as port and urban development. Any project involving work in the coastal waters of the United States will automatically be subject to review by at least four Federal agencies, typically

under five separate statutes. Many of the most sensitive areas in the coastal zone are enclosed ecosystems such as bays and estuaries, where development impacts are likely to spill over the boundaries of several local jurisdictions. Because the resources at stake are likely to be of more than usual significance, state agencies are also likely to have some control over proposed projects. Finally, these regulatory problems tend to become exaggerated in such areas when repeated conflicts cause normal avenues of communication and cooperation to become closed.

APPENDIX F

THE CITIZEN'S GRAYS HARBOR ESTUARY MANAGEMENT PLAN

CITIZENS' GRAYS HARBOR ESTUARY MANAGEMENT PLAN

SUBMITTED

TO THE

GRAYS HARBOR ESTUARY MANAGEMENT
TASK FORCE

AND THE

FEDERAL OFFICE OF COASTAL RESOURCES
MANAGEMENT

15 JANUARY 1983

CITIZENS' GRAYS HARBOR ESTUARY MANAGEMENT PLAN

1. The National, regional and local environmental and conservation organizations listed in Appendix A submit this draft Citizens' Grays Harbor Estuary Management Plan alternative to the Grays Harbor Estuary Planning Task Force and the Federal Office of Coastal Resources Management for consideration in the proposed draft EIS on the draft Grays Harbor Estuary Management Plan, as set out in 40 CFR §1502.14(a),(b) and (c) of the National Environmental Policy Act.

This draft alternative, called the Citizens' Estuary Plan, has been prepared because the organizations listed in Appendix A do not find that the proposed Estuary Management Plan developed by the Task Force has arrived at an acceptable "balance" between environmental and developmental objectives.

2. Key criteria of the Citizens' Estuary Plan include the following:

* Acceptance of the Estuary Management Goal for the Estuary which says that "the Grays Harbor estuary will be managed for multiple uses".

* Equally important, however, is the retention of the tests of water dependency and feasible alternatives analysis as the basis for estuary development decisions, and

* Increased protection for natural parts of the estuary.

3. Based on these criteria, certain elements in the Task Force plan are rejected:

a. Filling 73 acres of tideflats, wetlands and intertidal area north of the Bowerman Airfield in the Unique Wildlife Bowerman Basin ecosystem by the Port of Grays Harbor in M.U. 12.
This fill is rejected because its purpose is not water dependent (i.e. airport relocation), it would have an unacceptable adverse impact to the estuary and no in kind replacement habitat mitigation is proposed.

b. Filling 164 acres of tideflats. wetlands and intertidal area west of the Bowerman Airfield in the Unique Wildlife Bowerman Basin ecosystem by the Port of Grays Harbor in M.U. 12.
This fill is rejected because it would have an unacceptable adverse impact to the estuary and no in kind replacement habitat mitigation is proposed.

c. Filling 20 acres or wetlands north-east of the Bowerman Airfield in the Unique Wildlife Bowerman Basin ecosystem by the City of Hoquiam in M.U. 14.
This fill is rejected because its purpose is not water dependent, it would have an unacceptable adverse impact to the estuary and no in kind replacement habitat mitigation is proposed.

d. Filling 95 acres of freshwater wetlands as a dredge spoil disposal area by the Port of Grays Harbor in M.U. 26.
This fill is rejected because feasible alternatives exist (i.e. open water disposal) and no in kind replacement habitat mitigation is proposed.

e. Filling approximately 40 acres of tideflats, wetlands and intertidal area east of Ocean Shores by the City of Ocean Shores for an airport in M.U. 6.
This fill is rejected because its purpose is not water dependent; despite the fact that in kind replacement habitat mitigation is proposed.

f. Filling of an unspecified amount of acres of wetlands to expand an existing airport by the City of Westport in M.U. 38.
This fill is rejected because its purpose is not water dependent and no in kind replacement habitat mitigation is proposed.

g. Filling of an unspecified amount of acres of wetlands to expand an existing marina by the City of Westport in M.U. 39.
This fill is rejected because of lack of need and no in kind replacement habitat mitigation is proposed.

4. Since one of the key concepts in the Citizens' Estuary Plan is increased protection for natural parts of the estuary the following additional protective features must be included:

* Sec. 404(c) designation under the Clean Water Act for areas unsuitable for dredge or fill disposal.

* Recognition of the U.S. F&WS's endangered species determination under Sec. 7 of the Endangered Species Act that filling in 500 acres of the Bowerman Basin would likely jeopardize the endangered Peregrine Falcon and management of the area as an International Shorebird Sanctuary.

* The establishment of a mitigation plan in place prior to adoption of an estuary plan.

* Commitment to a sediment control study as part of any Dredged Materials Disposal Plan prepared by the Task Force.

* Ocean side management units established and adopted as part of any estuary plan for Westport and Ocean Shores.

5. The Citizens' Estuary Plan accepts and utilizes the basic political management unit divisions and categories which the Task Force has established. However, it reorders the priorities and assumptions under which development, especially by the Port of Grays Harbor, can take place.

In particular, a finding is made that the Port of Grays Harbor has currently at its disposal:

a. a 176-acre dredge spoil disposal site which is undeveloped and for which no inkind replacement habitat mitigation was carried out by the Port in M.U. 26.

b. a 45-acre (Kaiser Steel) site, speculatively filled by the Port in 1977, which is still undeveloped and for which no inkind replacement habitat mitigation was carried out in M.U. 15.

c. a 72-acre site at the Port's Terminal 2 in M.U. 15.

Thus, a total of 293 acres of shoreline area accessible to the navigation channel is available to the Port of Grays Harbor. If the 600 additional acres of potential filling allowed the Port by the Task Force were carried out, nearly a thousand acres of developable land would be placed at the disposal of the Port. We reject this approach to Port development.

We do not find in the Task Force's plan any requirements that the Port's existing land development listed in 5.a.-c., above, must be utilized first before additional filling is permitted.

6. Therefore, the Citizens' Estuary Plan recommends a three-phase plan as follows:

a. Phase I - The Port has 293 acres of development potential. These areas must be developed to the satisfaction of the Task Force and a citizen advisory committee to their fullest potential for water dependent purposes.

b. Phase II - The next development opportunity with the least environmental cost is utilization of the Bowerman Peninsula (approximately 200 acres) with a small amount of filling permitted in the south-west corner to align area with navigation channel.

This however, will require the Port to relocate their

Airport outside the estuary at one of three sites:

1. Central Park
2. Markham
3. Elma

as set out in the Bowerman Field Relocation Planning Study, June 1979, Grays Harbor Regional Planning Commission.

Thus, the Port must make a tradeoff as to whether the economic benefits of utilizing the Bowerman Peninsula for water dependent uses exceed the costs of relocating the airport.

c. Phase III - After the completion of Phase I and II to the satisfaction of the Task Force and a citizen advisory committee a further in-depth examination would be made to amend the Grays Harbor Estuary Management Plan to accomodate an additional 250 acres of fill someplace in the estuary. (This is the same process as set out for Area 4 in M.U. 12 in the Task Force's draft plan.)

Thus, further decisions and additional filling for specific water dependent projects would be dealt with through the plan amendment process. Under the Citizens' Estuary Plan, the Port of Grays Harbor would have 500 acres available to the Port for water dependent development in Phase I and II and the potential for an additional 250 acres in Phase III with minimum impacts to the Grays Harbor estuary.

7. Because the Task Force's plan provides little in the way of additional protections for important natural areas in the estuary the Citizens' Estuary Plan proposes the following:

a. The following 11 Management Units are recommended for designation under Sec. 404(c) of the Clean Water Act as areas prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U.'s 2, 7, 9s*, 19, 20, 29s*, 34s*, 36s*, 37s*, 41, and 42. These M.U.'s are all designated Natural or Conservancy Natural.

b. The following 4 Management Units are recommended in part for designation under Sec. 404(c) of the Clean Water Act as areas prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U.'s 12, 14, 18, 26.

c. The following Management Unit is also recommended for designation under Sec. 404(c) of the Clean Water Act as areas prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

M.U. 5. This M.U. is designated Urban Residential.

d. In addition, 9 Management Units are recommended for the Sec. 404(c) process of notice and comment without a

* means the shoreline part of a split management unit.

specific determination made at this time. The suitability of the following Management Units would be assessed during this process:

M.U.'s 1, 3, 22, 23, 27, 30, 40, and 43. These M.U.'s permit only bankline erosion control fills in the Task Force plan.

Thus, a total of 25 M.U.'s or parts of M.U.'s could be protected by such a finding by EPA under Section 404(c).

Sec. 404(c) designation would be of benefit for two reasons:

* It would clearly identify areas in which future filling may be contemplated but has not been brought to the attention of the Task Force. Since the 9 M.U.s listed in 7.d. above, conflict only with the bankline erosion control feature, we would like EPA to examine the tradeoffs of forgoing erosion control for protection from filling in these areas.

* It would clearly identify areas in which future filling would not be allowed by the Corps of Engineers.

Appendix B contains a description of each of the M.U.'s listed above.

8. Recognition of the U.S. F&WS's endangered species determination under Sec. 7 of the Endangered Species Act that filling in 500 acres of the Bowerman Basin would likely jeopardize the endangered Peregrine Falcon. This determination should be incorporated into the final plan. In addition, the Bowerman Basin would be designated and managed as an International Shorebird Sanctuary. See Appendix C.

9. The Task Force with the help of a citizen advisory committee would establish a mitigation plan to require in kind replacement of habitat for any wetland, intertidal, or tideflat area filled under an adopted plan. This mitigation plan should be in place prior to adoption and incorporated into the final plan.

10. The Task Force would commit to undertaking a sediment control study as part of any Dredged Materials Disposal Plan prepared by the Task Force. A request for such a study was specifically made by then-Governor Dan Evans in 1973. Since that time, the Corps has prepared a literature review, but no in-depth study has been carried out to comply with Gov. Evans' request. Control and reduction of sediments in the Chehalis River Basin could significantly reduce the amount of sediment which needs to be dredged, thereby reducing the pressure on wetland, intertidal and tidal flat filling, especially for maintenance dredging.

11. The Citizens' Estuary Plan also calls for the Task Force with the help of a citizen advisory committee to develop Management Units for ocean side coastal zone in and around the cities of Westport and Ocean Shores. These coastal areas are important and should be addressed within the context of this plan.

12. A Citizen Advisory Committee would be established by the State Dept. of Ecology to insure that the public is permitted to participate in the development of any revised plan or plan amendments.

13. The Citizens' Estuary Plan is submitted to the Task Force and Office of Coastal Resources Management as a viable alternative for review in the draft EIS.

APPENDIX A

The national, regional, and local environmental and conservation organizations listed below submit this draft Citizens' Grays Harbor Estuary Management Plan alternative to the Grays Harbor Estuary Planning Task Force and the Federal Office of Coastal Resources Management for consideration in the proposed draft EIS on the draft Grays Harbor Estuary Management Plan, as set out in 40 CFR §1502.14(a),(b) and (c) of the National Environmental Policy Act.

1. Natural Resources Defense Council
   San Francisco, CA
   Ralph Cavanaugh

2. Washington Environmental Council
   Seattle, WA
   Benella Caminiti

3. N.W. Steelheaders - Grays Harbor Chapter
   Aberdeen, WA
   Jerry Paveltich

4. N. Beach and Pacific Co. Environmental Council
   Seattle, WA
   Liz Greenhagen

5. Seattle Audubon Chapter
   Seattle, WA
   Lorna Campion

6. Tahoma Audubon Chapter
   Tacoma, WA
   Carla Hansmann

7. Black Hills Audubon Chapter
   Olympia, WA
   Jack Davis

8. N.W. office, Friends of the Earth
   Seattle, WA
   Dale Jones

APPENDIX B

The following is a description of the Management Units recommended for Sec. 404(c) designation as unsuitable for the disposal of dredged or fill material:

Unit 2 NATURAL

Description: The character of this area contains areas of more natural, estuarine influence. It also encompasses all of the state game properties and would remain in an undisturbed natural condition.

Finding: Filling would have an unacceptable adverse effect on wildlife and fishery areas.

Unit 7 CONSERVANCY MANAGED

Description: The predominant character of this area is natural, aquatic with heavy tidal influence. Specific resources include oyster and fish rearing, waterfowl and shorebird resting, feeding and rearing, recreation and commercial harvesting of fish, shellfish, and wildife. This area is to remain in an undisturbed condition.

Finding: Filling would have an unacceptable adverse effect on shellfish beds and fishery, wildlife and recreational areas.

Unit 9s* RURAL LOW INTENSITY/NATURAL

Description: The predominant character of this area is natural, aquatic with heavy tidal influence. Specific resources include oyster and fish rearing, waterfowl and shorebird resting,

* means the shoreline part of a split management unit.

feeding and rearing, recreation and commercial harvesting of fish, shellfish, and wildlife. On the water side of the Section 404 line, in this split management unit, the area will remain in an undisturbed, natural condition.

Finding: Filling would have an unacceptable adverse effect on shellfish beds and fishery, wildlife and recreational areas.

Unit 19 CONSERVANCY MANAGED SPECIAL

Description: This area is an important fish passage, rearing and feeding area; it provides a commercial fishery on migrating fish; and it also functions as a natural water storage area.

Finding: Filling would have an unacceptable adverse effect on an important fishery area.

Unit 20 CONSERVANCY MANAGED

Description: This area is an important fish passage, rearing and feeding area; it provides a commercial fishery on migrating fish; and it also functions as a natural water storage area. This area is to remain undisturbed from its present natural condition.

Finding: Filling would have an unacceptable adverse effect on an important fishery area.

Unit 29s* CONSERVANCY MANAGED/NATURAL

Description: The predominant character of this area is aquatic with heavy tidal influence and substantial commitments to

commercial fishing, oyster production and crab and fish rearing. The Johns River area is considered one of the prime natural areas in the estuary. On the water side of the Section 404 line, in this split management unit, the area will remain in an undisturbed, natural condition.

Finding: Filling would have an unacceptable adverse effect on shellfish beds and fishery and wildlife areas.

Unit 34s* CONSERVANCY MANAGED/NATURAL

Description: The predominant character of this area is natural. In addition to a substantial fish and shellfish resource and wildlife habitat, the area is committed as a major private recreational area for hunting and wildlife observation. It is a relatively undisturbed natural area with no conflicts or pressures. The Elk River tideflats and water area of this management unit contain some of the most significant wildife populations and habitat. On the water side of the Section 404 line, in this split management unit, the area will remain in an undisturbed, natural condition.

Finding: Filling would have an unacceptable adverse effect on shellfish beds, fishery, wildlife and recreation areas.

Unit 36s* RURAL LOW INTENSITY/CONSERVANCY MANAGED

Description: The predominant character of this area is natural. In addition to a substantial fish and shellfish resource and

wildlife habitat, the area is committed as a major private recreational area for hunting and wildlife observation. It is a relatively undisturbed natural area with no conflicts or pressures. On the water side of the Section 404 line, in this split management unit, the area will be preserved in an undisturbed condition.

Finding: Filling would have an unacceptable adverse effect on shellfish beds, fishery, wildlife and recreation areas.

Unit 37s* URBAN MIXED/CONSERVANCY MANAGED

Description: Large areas of salt marsh and tideflats exist in the undeveloped parts of the general area. On the water side of the Section 404 line, in this split management unit, the salt marsh will be preserved in its natural condition.

Finding: Filling would have an unacceptable adverse effect on fishery areas.

Unit 41 NATURAL

Description: This is the general zone around Goose and Sand Islands, specifically the Department of Natural Resources' Scientific Preserves plus an area equal to an additional ½ mile around the islands.

Finding: Filling would have an unacceptable adverse effect on wildlife areas.

Unit 42 CONSERVANCY NATURAL

Description: The general zone known as Whitcomb Flats. This area contains valuable oyster beds.

Finding: Filling would have an unacceptable adverse effect on shellfish beds.

The following is a description of the Management Units partially recommended for Sec. 404(c) designation as unsuitable for the disposal of dredged or fill material:

Unit 12 SPECIAL

Description: This is the Unique Wildlife Bowerman Basin Ecosystem, an area of international importance to shorebirds and the endangered Peregrine Falcon. As such, Sec. 404(c) designation will afford additional protection to the following areas as set out in the Task Force plan:

> AREA 1 - approximately 1,700 acres. This area represents a recognized significant shorebird habitat.
>
> AREA 3 - approximately 73 acres. This area also represents a recognized significant shorebird habitat.

At this time AREAS 2 and 4 - approximately 164 acres and 243 acres - would be kept in their natural state subject to a final determination under Phase III of the Citizens' Estuary Plan.

Finding: Filling AREAS 1 and 3 would have an unacceptable adverse effect on a significant wildlife area.

Unit 14 URBAN DEVELOPMENT

Description: This management unit borders on the Unique Wildlife Bowerman Basin Ecosystem. Sec. 404(c) designation will afford additional protection to the following area as set out in the Task Force plan:

> AREA 5 - approximately 20 acres. This area represents part of a recognized significant shorebird habitat.

Finding: Filling AREA 5 would have an unacceptable adverse effect on a significant wildlife area.

Unit 18 URBAN DEVELOPMENT/NATURAL

Description: This unit encompasses Elliot Slough, a water body of significant biological importance, as well as two additional connecting sloughs (Slough A and B). All aquatic vegetated areas within Sec. 404 jurisdiction in Elliot Slough and Sloughs A and B should be designated under Sec. 404(c).

Finding: Filling in Elliot Slough and Sloughs A and B would have an unacceptable adverse effect on a significant wildlife and fisheries area.

Unit 26 URBAN DEVELOPMENT/CONSERVANCY MANAGED

Description: This area contains critical vegetation to upriver fish migration and feeding. Additionally, two upland creeks with significant adjacent habitat traverse the area. On the water side of the Section 404 line, in this split management unit the area will remain in an undisturbed natural condition. In

particular, the 95-acre freshwater wetland site between Charley and Newskah Creek is recognized as particularly important to fisheries and wildlife.

Finding: Filling between Charley and Newskah Creek and north of the Burlington Northern Railroad line would have an unacceptable adverse effect on fishery and wildlife areas.

The following Management Unit is also recommended for designation under Sec. 404(c) of the Clean Water Act as an area prohibited by the Administrator of EPA for use as a disposal area for the discharge of dredged or fill material:

Unit 5 URBAN RESIDENTIAL

Description: The Task Force's plan would allow residential housing in this management unit. Residential housing is not a water dependent use and should not be encouraged on the shoreline. This is an area which contributes to the total productivity of the estuary. All wetlands, mudflats and intertidal areas within the Sec. 404 jurisdiction should be protected.

Finding: Filling would have an unacceptable adverse effect on fishery, and wildlife areas.

Finally, the following Management Units are recommended for the Sec. 404(c) process of notice and comment without a specific finding made at this time. The suitability of the

following management units would be assessed during this process:

Unit 1 CONSERVANCY MANAGED

Description: The area of and east of north jetty.

Unit 3 CONSERVANCY MANAGED

Description: Damon Point which is considered a valuable recreational resource.

Unit 22 RURAL AGRICULTURE

Description: An important area in the upper Chehalis River.

Unit 23 RURAL LOW INTENSITY

Description: Another important area in the upper Chehalis River.

Unit 27 RURAL LOW INTENSITY

Description: Shoreline area along south side of estuary.

Unit 30 RURAL LOW INTENSITY/CONSERVANCY

Description: Significant wetland areas exist within this management unit. On the water side of the Section 404 line, in this split management unit, the area should remain in an undisturbed, natural condition.

Unit 40 CONSERVANCY MANAGED

Description: This is the south jetty similar to M.U. 1.

Unit 43 CONSERVANCY MANAGED

Description: The Rennie Island area. Sec. 404(c) designation should be considered for those areas not presently authorized for dredge spoil disposal.

APPENDIX C

Copy of U.S. Fish and Wildlife Service's Section 7 determination under the Endangered Species Act (31-3-81-F-407), 13 March 1981, (14 pages).

> "It is. . .our biological opinion that the development of Bowerman Basin (Unit 13), which is a part of the GHEMP, as presented in (OCZM's) November 24, 1980 assessment, is likely to jeopardize the continued existence of the peregrine falcon. . .
>
> "We cannot insure that the alternative development plan presented in (OCZM's) January 6, 1981 assessment will not jeopardize the continued existence of the peregrine falcon. Therefore, based on the best scientific information available, this Service is of the opinion that this action may jeopardize the continued existence of the peregrine falcon." (p. 2)

(Full text of opinion to be added.)

APPEENDIX C

Copy of U.S. Fish and Wildlife Service's Section 7 determination under the Endangered Species Act (31-3-81-F-407), 13 March 1981, (14 pages).

> "It is. . .our biological opinion that the development of Bowerman Basin (Unit 13), which is a part of the GHEMP, as presented in (OCZM'S) November 24, 1980 assessment, is likely to jeopardize the continued existence of the peregrine falcon. . .
>
> "We cannot insure thatthe alternative development plan presented in (OCZM's) January 6, 1981 assessment will not jeopardize the continued existence of the peregrine falcon. Therefore, based on the best scientific information available, this Service is of the opinion that this action may jeopardize the continued existence of the Peregrine falcon." (p. 2)

(Full text of opinion to be added.)

NORTHWEST OFFICE
FRIENDS OF THE EARTH
4512 UNIVERSITY WAY N.E.
SEATTLE, WA 98105

RECEIVED
MAR 20 1981

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Area Office
2625 Parkmont Lane
Olympia, Washington 98502

March 13, 1981

Dr. Robert R. Kifer, Chief
NEPA Compliance Unit
Department of Commerce
National Oceanic and Atmospheric Administration
Office of Coastal Zone Management
Washington, D. C. 20235

Dear Dr. Kifer:

This is the U.S. Fish and Wildlife Service's (FWS) reply to your November 24, 1980 request for formal consultation (#1-3-81-F-407). This Service requested an extension to the consultation period on February 13, 1981, in order to address the alternative plan documented in the addendum to your assessment dated January 6, 1981. Your agreement to extend the consultation period to March 15, 1981 was given in your letter of February 23, 1981. This consultation addresses the proposed Grays Harbor Estuary Management Plan (GHEMP), including the alternative plan, and its subsequent impacts to the bald eagle (Haliaeetus leucocephalus alascansus), listed as threatened in Washington; brown pelican (Pelicanus occidentalis californicus), listed as endangered in Washington; the peregrine falcon-subspecies American peregrine falcon (Falco peregrinus anatum) and Arctic peregrine falcon (Falco peregrinus tundrius)--which are Federally listed as endangered in Washington.

On March 10, 1981, we completed a review of the proposed GHEMP, the subsequent alternative, dated January 6, 1981, reports transmitted with your consultation request, and relevant literature. Several individuals with particular expertise and knowledge of peregrine falcons, shorebirds and Grays Harbor were contacted for additional information. Quantitative and qualitative site-specific information on shorebirds and peregrine falcons in Grays Harbor in general, and Bowerman Basin in particular, were supplied by Dennis Paulson, Washington State Museum, University of Washington, and Steve Herman and co-workers from The Evergreen State College. The following wildlife biologists from the Washington Department of Game were contacted: Eric Cummins, Fred Dobler and Jack Smith. Bob Gill (shorebird research program leader - Anchorage) and Dave Harlow (peregrine falcon recovery team) of the U.S. Fish and Wildlife Service were contacted as was Richard Olendorff (peregrine falcon recovery team) of the Bureau of Land Management. Additional information was supplied

by Clifford (Bud) Anderson, peregrine falcon researcher, Bellevue, Washington; Pete Conners, Bodega Bay Marine Lab, Bodega Bay, California and Lynne Stenzel, Point Reyes Bird Observatory, Stinson Beach, California.

Both aerial and ground field trips were conducted to gain a sense of topography and habitat types. Information was also gathered from an interagency public meeting held on December 8-10, 1980. The GHEMP proposal and a suggested development alternative were discussed at this meeting, as reflected in the addendum to the GHEMP biological assessment completed on January 6, 1981.

Biological Opinion

It is the Service's biological opinion that the implementation of the GHEMP as described in your biological assessment dated November 24, 1980 and the addendum dated January 6, 1981, which included the alternative plan, are not likely to jeopardize the continued existence of the bald eagle or brown pelican. Therefore, these two species will not be discussed in the remainder of this biological opinion. It is also our biological opinion that the development of Bowerman Basin (Unit 13), which is a part of the GHEMP, as presented in your November 24, 1980 assessment, is likely to jeopardize the continued existence of the peregrine falcon. As defined in the Service's Interagency Cooperation Regulations published in the Federal Register (FR 875; 1/4/78), the phrase "jeopardize the continued existence of "means to engage in an activity or program which reasonably would be expected to reduce the reproduction, numbers, or distribution of a listed species to such an extent as to appreciably reduce the likelihood of the survival and recovery of that species in the wild.

We cannot insure that the alternative development plan presented in your January 6, 1981 assessment will not jeopardize the continued existence of the peregrine falcon. Therefore, based on the best scientific information available, this Service is of the opinion that this action may jeopardize the continued existence of the peregrine falcon. We base this opinion on the fact that the alternative plan is conceptual and specific biological information associated with the impacts and the areas to be impacted is insufficient. Implementation of protective measures which are offered as reasonable and prudent alternatives in a latter section of this opinion could lead to a non-jeopardy opinion.

To aid in developing a perspective for our opinion, we have included an account of the proposal, as presented in OCZM's biological assessment, and a rationale of our opinion.

Project Description

Grays Harbor is one of the Pacific Coast's six major estuary systems and is located on the southern Washington coast (Fig. 1). The harbor lies wholly within Grays Harbor County. The major cities of Aberdeen and Hoquiam are situated in the estuary's upper reaches. Their economies depend in large part upon Grays Harbor as a resource for fishing, shipping

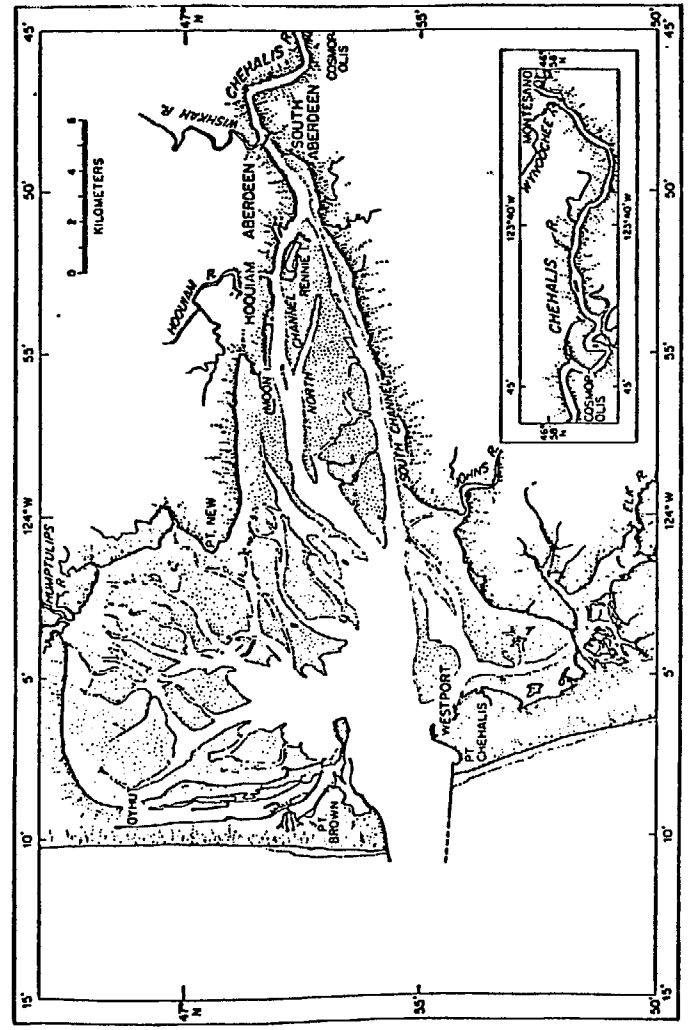


Figure 1. The Grays Harbor Estuary, Grays Harbor, WA

and logging. Because of its shallow depth, there have been numerous dredge and fill activities in the harbor since the early 1900's. Records between 1940 and 1976 indicate that approximately 3,850 acres (1,559 ha) of intertidal lands in Grays Harbor, including portions of Bowerman Basin, have been used for dredge material disposal (Smith and Mudd 1976). This figure represents 11.5 percent of total intertidal lands (33,600 acres or 13,598 ha) in the estuary for an average annual change of 110 acres (44.5 ha). Conservative estimates indicate at least 1,540 acres (623 ha) of vegetated wetlands have been permanently committed to upland use. Thus a significant part of the estuary has been modified due to man-made causes. Level land is scarce and has generally been created by the processes of estuarine deposition and man-made fill.

Management Plan

The GHEMP is a management plan that guides future decisions for the next 50 years related to the use of the estuary. The plan is the result of interagency cooperation and efforts. It attempts to provide a balance between the human use of the estuary to meet the region's social and economic needs and the need to conserve and protect the long-term productive capacity of the estuarine ecosystem and its related recreational and natural values. An annual and more substantive five-year review will be conducted to evaluate the effectiveness of the plan. Without the plan, the undirected piece-meal approach to development, with the subsequent loss of important ecological values that has been so prevalent in the past, will undoubtedly continue. The proposed plan concentrates new economic developments requiring intertidal fills in a few areas while protecting most of the rest of the estuary.

GHEMP is a three-tier policy plan which recognizes that one set of policies applied to the entire estuary cannot provide adequate guidance to property owners and government decisionmakers. The first policy level is the overall goal to "manage the estuary for the multiple uses which it can provide." Types of uses include: port facilities, manufacturing, transportation, food industry, commercial, recreation, residential, agricultural, fish and wildlife habitat, and natural areas. The plan attempts to accomodate each of these diverse uses in a practical and environmentally sound way.

The second level broadly categorizes uses of land and water into eight planning areas based on a common set of natural and man-related features including land ownership, political jurisdictions, existing uses, areas of existing or possible conflict, and physical boundaries or features. The planning areas provide a basis for describing how different areas of the estuary function and how they might function in the future. Each planning area is described in terms of its existing character, its major committed uses, its conflicts and assets, and includes recommended planning guidelines for the future use of the area.

The third level of policy in the plan, the Management Unit, is the most specific level and is designed to give guidance to property owners and government agencies in evaluating project proposals. The plan establishes forty-four (44) Management Units (Fig. 2), each classified as one of the following: natural, conservancy natural, conservancy managed, rural agricultural, rural low intensity, urban residential, urban mixed and urban development.

The largest and most controversial area for new development is the area north and west of Bowerman Airport. This area contains 2,200 acres owned by the Port of Grays Harbor and, in the November 1980 GHEMP, is divided into approximately 500 acres of developable (Management Unit 13) and 1,700 acres non-developable (Management Unit 12) wetlands. Previous drafts of the plan have called for speculative filling of the first 250 acres of Unit 13 before tenants were identified or uses determined. There was also some discussion of predesignating Unit 13 as a dredge disposal area for the proposed Grays Harbor Deepening and Widening project. The current proposal presented in your Biological Assessment of November 24, 1980, eliminates the speculative fill of Unit 13 and does not designate Unit 13 as a dredge spoil disposal area for the deepening and widening project. It may be used for other dredge disposals if the EPA/Corps 404 permit requirements are met. These requirements are: 1) that the activity associated with the fill is either water-dependent or there is no practicable site or construction alternative for the activity; 2) that there is a need for the proposed activity; 3) that there are no less environmentally damaging alternatives; and 4) that there are no unacceptable adverse impacts to the aquatic ecosystem from the fill and the activity associated with it.

In concert with this development scheme, Unit 12, the area west of the end of the airport, would be set aside for non-development. This set aside would be assured by two levels of protection: the area is set aside in the plan for fish and wildlife and the Corps cannot issue permits for development in the area because of consistency provisions in the Coastal Zone Management Act. Another level of protection would be provided through conservation easements or deed transfers of the port's land title to Washington Department of Game and possibly the Service, as permits in Unit 13 are granted. The proportion is approximately 3 acres in Unit 12 set aside for each acre filled in Unit 13, so that if all of Unit 13 is developed, all of Unit 12 would be transferred to a resource agency.

Two plans are now being been discussed as to how port development would be accomplished. The original plan is identified in the GHEMP under Unit 13. In public meetings held on December 8-10, 1980, and in an addendum to the OCZM biological assessment dated January 6, 1981, an alternative plan for development was proposed which OCZM postulated would not impact Bowerman Basin as severely as the first plan. While the exact configuration and specifications of the alternative are not yet decided, Figures 3 and 4 suggest two possible configurations, as supplied by OCZM. This included filling along the existing pennisula while leaving the major portion of tidal flats and marsh in Bowerman Basin unaltered.

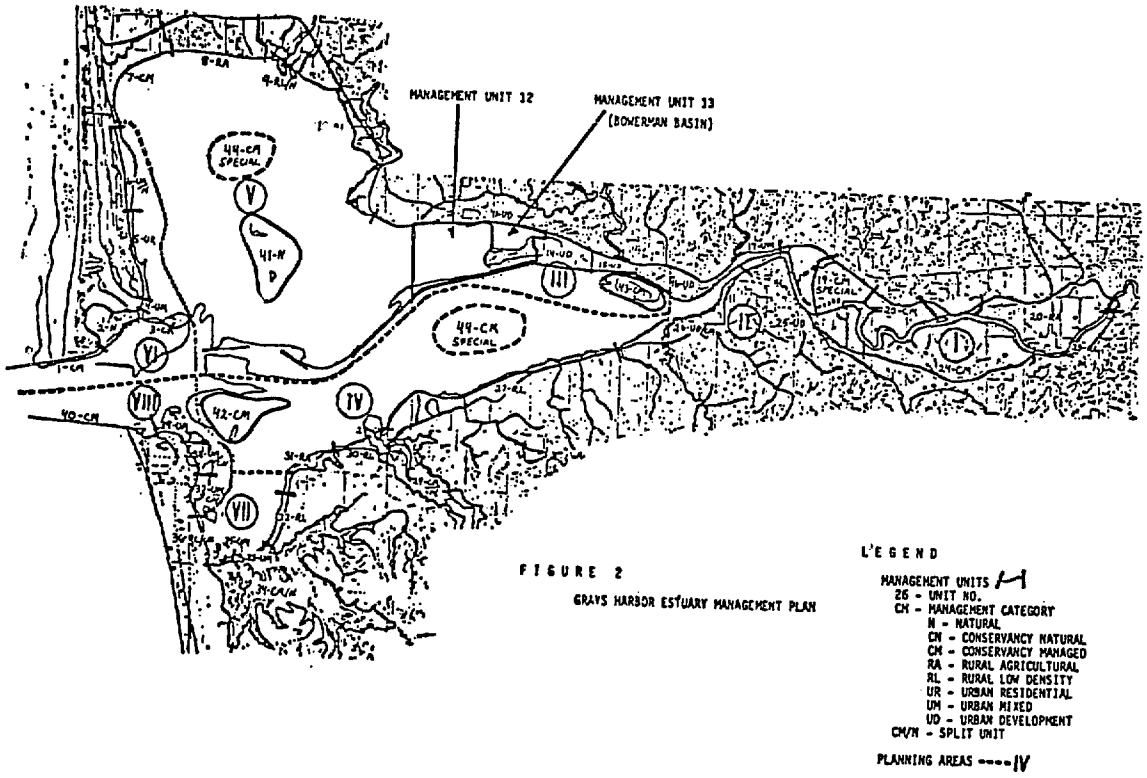


FIGURE 2

GRAYS HARBOR ESTUARY MANAGEMENT PLAN

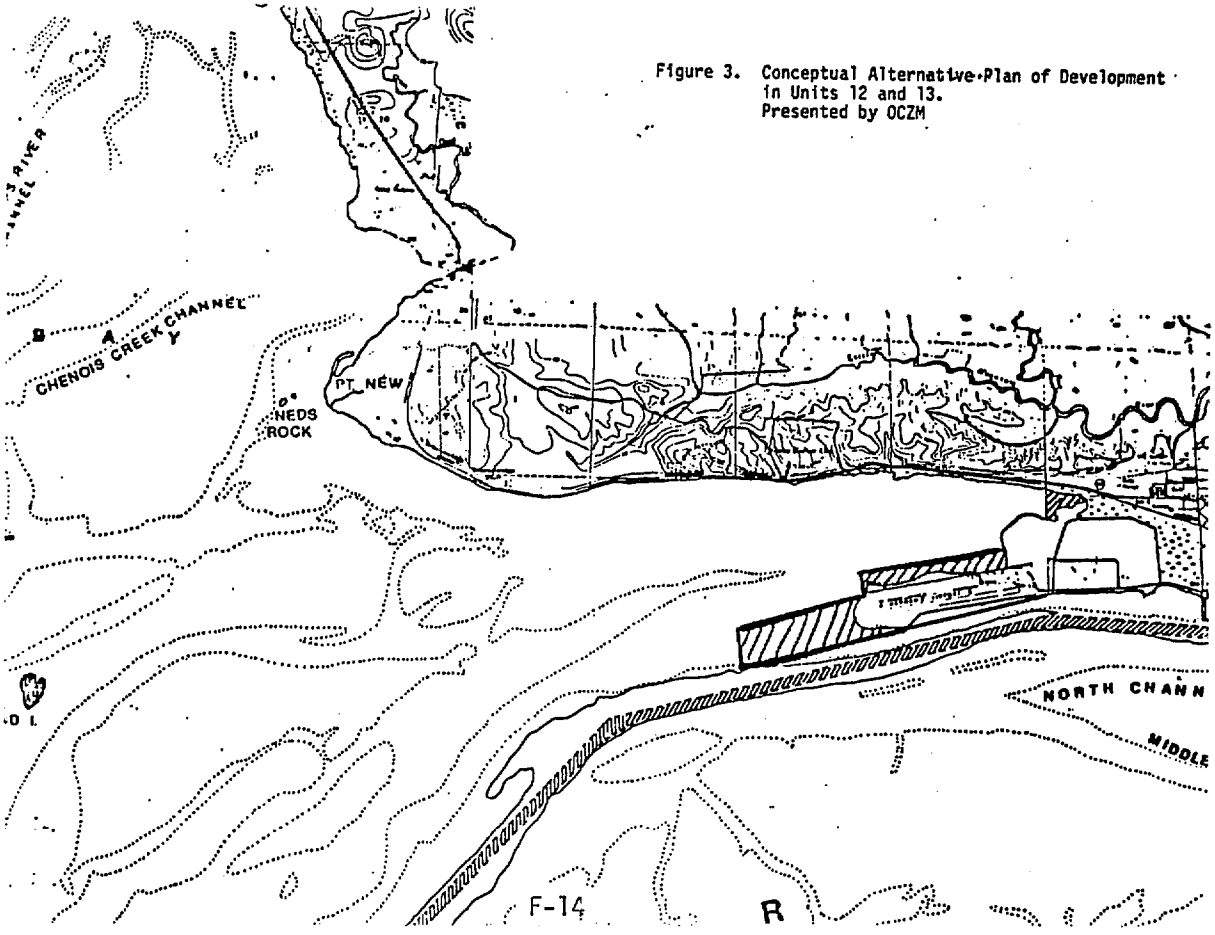


Figure 3. Conceptual Alternative Plan of Development in Units 12 and 13. Presented by OCZM

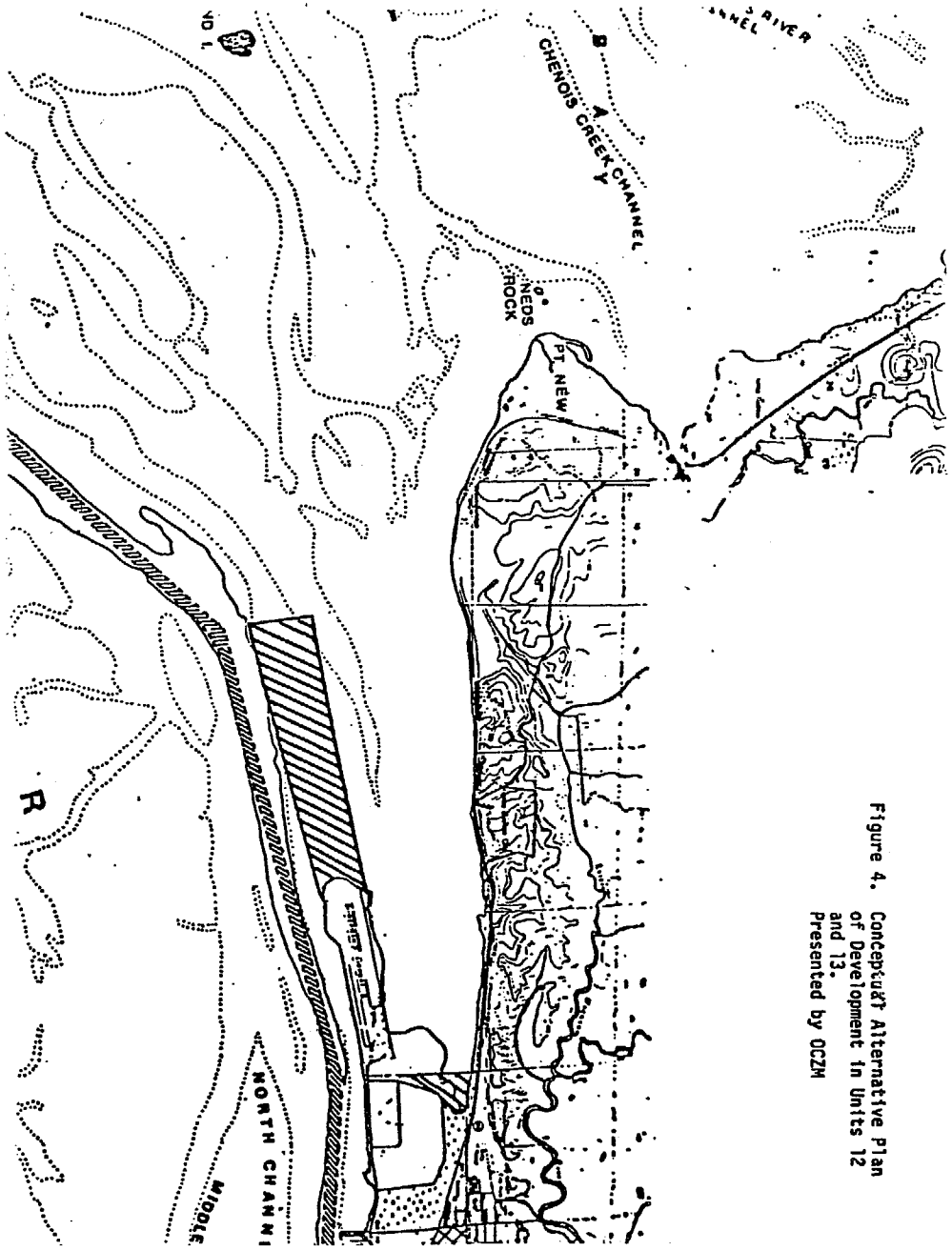


Figure 4. Conceptual Alternative Plan of Development in Units 12 and 13. Presented by OCZM

Species Account

There are deficiencies concerning all aspects of the ecology and distribution of peregrine falcons, not only from Grays Harbor, but with the entire northwest populations of the two endangered sub-species. However, there does exist a broad, though not always site-specific information base available from documented field studies and the personal knowledge and educated assumptions of qualified researchers that encompass these aspects. Among others, these aspects include: population size and distribution, speciation, migrational patterns and habits, food requirements and feeding habits, behavior (both innate and learned), spatial and temporal relationships within their environment, ecological requirements and responses to perturbations, both natural and human-induced.

The following account has been developed to summarize some of the available information, from the general to the specific, as it relates to the intricate predator-prey relationship of the peregrine and its food base. The attempt has been made, through this overview, to document, indicate, and emphasize the apparent importance of Grays Harbor, in particular the Bowerman Basin area, to the well-being of the peregrine falcon.

Washington State has had the highest number of recorded winter sightings of peregrine falcons in the western United States (Anderson 1981), with Grays Harbor being one of four nationally known areas where peregrine falcons can be observed during winter on a predictable basis. Observations of peregrines at Grays Harbor have been documented during all four seasons (Dobler 1980) indicating important values exist in addition to winter requirements. However, winter habitat is an essential component for the welfare of this falcon, yet it occurs in limiting quantities in Washington State (Anderson 1981). The vast number of shorebirds and waterfowl using Grays Harbor is the likely reason peregrines concentrate in this bay (Herman 1981, Paulson 1981). There is no record of nesting in the area. The lack of suitable cliffs in the Grays Harbor area seemingly precludes nesting of peregrine falcons.

Peregrines have been observed at Grays Harbor most notably during the fall, winter and spring. They utilize the abundant preybase of shorebirds and waterfowl (Smith and Mudd 1976, Herman 1981, Paulson 1980). Observations and morphological characteristics of falcons trapped on the Skagit Flats, about 140 airmiles to the northeast (Anderson and Debruyn 1979), suggest the majority of peregrines wintering at Grays Harbor are the subspecies anatum rather than Peales peregrines (F. p. pealei), a subspecies indigenous to the northwest maritime area which is not listed as threatened or endangered. Arctic peregrine falcons (F. p. tundrius) have also been collected and observed (Herman and Anderson 1981). Arctic peregrine falcons from Alaska may be utilizing the preybase at Grays Harbor during spring and fall migrations. The peak spring (late April-May) and fall (September-October) migrations of shorebirds recorded at Bowerman Basin (Smith and Mudd 1976, Gill 1981, Herman 1981) tend to coincide with migration dates of early May and mid-September when peregrine falcons return and leave Alaska (Jurs 1978).

There is sufficient documentation to conclude that peregrine falcons are opportunistic feeders and that the bulk of their diet consists of a variety of birds. However, it must be noted that there exists an age and sex differential preference for prey items and with foraging strategies. Adult females, being larger than males, show a marked ability to pursue and catch larger prey such as waterfowl. The smaller adult males and immature birds that have not developed refined hunting strategies tend toward the pursuit of smaller prey with a higher success rate of kill (Hunt, et al. 1975, Anderson and DeBruyn 1979, and others). Recent records (1972-1981) from Grays Harbor (Herman and Anderson 1981) indicate that the majority of birds utilizing the area are adult males and immature birds of both sexes. This is in contrast to the high numbers of adult females, and subsequent use of waterfowl as a food source, on the Skagit Flats (Anderson and DeBruyn 1979). Other data collected by Herman (1981) show the peregrine falcons in Grays Harbor, including adult females, to be pursuing and catching primarily dunlin (Calidrus alpina) and to a much lesser extent western sandpiper (Calidrus mauri) and waterfowl. Waterfowl are present in lesser numbers in Grays Harbor than are shorebirds and are much more broadly distributed (Smith and Mudd 1976). Unlike the situation observed on the Skagit Flats in the Anderson and DeBruyn studies (1979), waterfowl at Grays Harbor are not as susceptible to being killed by peregrine falcons. Their studies revealed the majority of successful pursuits by falcons occurred when waterfowl were engaged in feeding forays in croplands and pastures. Due to the lack of extensive crop and pasturelands adjacent to Grays Harbor, waterfowl spend the majority of their time feeding and loafing on or near the water, a position which may render them less susceptible to being killed by falcons.

Peregrine falcons have been recorded from all areas of the estuary. However, there appears to be a time-sequential mode to the observations. Collection around the turn of the century, before serious man-induced modifications, were most frequent at Westport. Latter sightings were most frequently recorded on or near the Ocean Shores peninsula with a progression to the North Bay area. Sightings are still made in these areas, at South Bay and along the southern channel. However, recent sightings have trended toward the vicinity of Bowerman Basin and to the west of Moon Island (GHEMP Units 12 and 13). A minimum of 33 sightings have been documented in these two units from 1972-1981, with a maximum of three individuals observed in one day, with substantially fewer sightings documented elsewhere in the estuary (Herman and Anderson 1981). The actual number of peregrines utilizing Grays Harbor on an annual basis is unknown. A conservative, qualitative evaluation, based on past sightings and knowledge of the area, indicates that 12 peregrine falcons may be overwintering at Grays Harbor in addition to those present during the fall migration and in the spring (Herman 1981). However, one of the obvious and serious data deficiencies on falcons occurring in Grays Harbor is exact knowledge of precise routes of migration and precise wintering grounds used by these populations, as well as temporal and spatial distribution within Grays Harbor.

The distribution of shorebirds, primarily dunlin, which are the most prevalent birds in Grays Harbor, is not evenly spaced (Smith and Mudd 1976, Herman 1981). Shorebird numbers have reached recent highs of over 400,000 in late April (Herman 1981) in Bowerman Basin. The dunlin comprised the vast majority of these birds. Smith and Mudd (1976) recorded migration peaks of 156,000. They also recorded shorebird winter use (December-March) to be 20,000 to 37,000, with dunlins comprising from 60 to 98 percent of the birds present on the tidal mudflats and western sandpipers comprising 1 to 31 percent. Recent surveys (Herman 1981) indicate that an average of 12,000 to 15,000 dunlin utilize Bowerman Basin for feeding activities in winter. When considering recent simultaneous surveys of the entire Grays Harbor estuary, such as the 1980 Audubon Christmas Bird Counts, Bowerman Basin (GHEMP Unit 13) and the area immediately to the west (GHEMP Unit 12) held about 63 precent (17,850) of the dunlin, the most frequently recorded species in the estuary. It is not unlikely that there is substantial use by dunlin of other areas of the estuary for feeding and roosting, depending on weather and tidal factors (Paulson 1980, Herman 1981), but it is evident that GHEMP Units 12 and especially 13 are the areas preferred and most heavily utilized by dunlin and subsequently peregrine falcons. A review of topographic charts and recent aerial photos indicate that Bowerman Basin and much of Unit 12 to the west are the last mudflats to be covered by tidal water and the first to be revealed as the tide recedes. Furthermore, it appears that Grays Harbor and particularly Units 12 and 13 have had the largest concentrations of dunlin of any estuary along the Pacific coast (Paulson 1980). No other estuaries that support the same magnitude of shorebirds exists between Grays Harbor and Alaska. It should be noted that avian species other than dunlin utilize Units 12 and 13. Herman (1981) offered records showing 62 species of waterbirds and raptors occurring in these units. Twenty-two of these species were shorebirds.

There is a consistent pattern of dunlin use in Grays Harbor. Herman (1981) and Paulson (1981) both report that birds normally approach the management units in question, GHEMP Units 12 and 13, from the southwest and southeast, flying around the tip of Bowerman Field and landing on exposed portions of tidal mudflats, primarily the north side of Bowerman Field and the east end of Bowerman Basin. As the tide recedes, birds continue moving onto the exposed mudflats. Peregrine falcons apparently follow the same pattern based on distribution and abundance of birds. Dunlins utilize the high marsh at the east end of Unit 13, around Little Moon Island in Unit 12 and the tip of Bowerman Field for roosting at night and during high tides. However, these areas do not support all of the birds. The largest roosting areas are unknown but indications are that they may occur to the south (possibly along the south channel) and possibly in the vicinity of North Bay and South Bay. Paulson (1981) also believes that more than one roosting area is essential. As was mentioned earlier, the dunlin also make use of feeding areas other than Units 12 and 13 as they are opportunistic feeders. Other areas may also serve as overflow sites but may be of less value as indicated by similar studies conducted by Page, et al. (1979), Gerstenberg (1979) and Goss-Custard (1967). Furthermore, Smith and Mudd (1976) believe that shorebird feeding habitat is a limiting factor in Grays Harbor.

Of further importance is the fact that dunlin and western sandpipers are philopatric species in that they select certain specific areas for their activities and utilize these same areas annually, even when other seemingly suitable habitat is nearby (Jehl, Jr., 1979, Gill 1981, Stenzel 1981, and others).

The extensive review by Smith and Mudd (1976), which addressed the relationship of Bowerman Basin to dunlins and peregrine falcons, is revealing. To summarize, the bulk of the dunlin's diet consisted of invertebrates, primarily the amphipods Corophium sp. and Anisogammarus confervicolous. They also supplement their diet with seeds from salt marsh plants. These seeds were usually consumed when high winter waters and high tides force the birds to feed on the salt marsh fringes. Esophageal contents of dunlin collected in Bowerman Basin consisted of 85.5 percent amphipods while those to the west in GHEMP Unit 12 contained 31.7 percent amphipods. Invertebrate sampling in those same areas showed densities of Corophium sp. of about 10,000-50,000 per M^2. The density was highest in Bowerman Basin and substantially lower in GHEMP Unit 12. Levels for both areas were highest in summer and much reduced in spring. Winter densities can be expected to be substantially lower. This is in concert with Smith's (1977) data that showed amphipods, particularly Corophium sp., capable of recolonizing mudflats within 30 days in summer and 90 days in winter, providing that sediment, water quality, and depth conditions are suitable. Abundance of invertebrates corresponded with patterns of observed feeding shorebirds.

This pattern of amphipod-dunlin-peregrine use is based on preferred or required amphipod habitat. These two species of amphipods are normally found in sediment sizes of 4 Phi or smaller (silty sand to silt-clay) and at elevations below +7 feet. These same conditions exist in Bowerman Basin and to a lesser extent in GHEMP Unit 12. Unit 12 has been recently modified by unconfined spoil disposal that has left more sand and higher elevations. It should be noted that this entire area (Units 12 and 13) has the most extensive area of silt-clay substrate, elevations below +7 feet in association with highwater roosting areas, and more protection from severe winter storms which are accompanied by high tides and influx of river water, than any other unit in Grays Harbor. These conditions have resulted in a mosaic of habitats that allow extensive and preferred utilization of the two units by dunlins and other shorebirds, and consequently, peregrine falcons.

Analysis of Impacts

The implemention of GHEMP will provide a predictable pattern of development for industry and conservation interests within the Grays Harbor area. Without implementation of the GHEMP, the undirected and unpredictable approach to development with the corresponding loss of ecological values will undoubtedly continue as it has in the past. The proposed GHEMP satisfies most of the recognized requirements for the protection of a variety of natural resources including peregrine falcons and their preybase.

However, one element of GHEMP, the development of Bowerman Basin for water-dependent industry could severely impact up to 400,000 shorebirds and 50,000 waterfowl by eliminating a seasonally-selected and used feeding area that is integral to the birds' well-being. Shorebirds tend to congregate and feed in the Basin during the fall to spring months, but use the area most intensively during the spring to build energy reserves prior to migrating to the Copper River Delta in Alaska (Gill 1981). Reasons for the heavy use by shorebirds in Units 12, and particularly 13, appear to be their philapatric nature, the site's high level of protection, high sustained preybase, and availability of nearby roosting habitat. This area increases in importance considering that quality shorebird feeding habitat may be a limiting factor at Grays Harbor (Smith and Mudd 1976).

A number of peregrine falcons, possibly as many as 12 in the winter in addition to others during the spring and fall, are dependent on these birds for sustenance while at Grays Harbor. Recorded sightings of peregrines indicate a predominance of adult males and immature birds of both sexes which can utilize the high densities of shorebirds more efficiently than they can utilize waterfowl. The reduction of the existing preybase, caused by filling and developing Bowerman Basin, will undoubtedly cause peregrine falcons to be displaced and will result in increased inter-specific and intraspecific competition for the remaining food and winter habitat. This would cause additional stress and weight loss during winter which could affect productivity during the spring, by reducing or eliminating clutches laid by those female peregrines utilizing the Harbor. This potential decrease in productivity and increased stress within the juvenile segment of the population is especially significant in a race of birds already suffering a 50 to 90 percent mortality rate among juveniles (depending on the subspecies). The same physiological and reproductive problems may be encountered by shorebirds, particularly the dunlin. The value of winter habitat for dunlins and peregrine falcons is considered to be just as essential as nesting habitat for the survival of the species by those authorities personally contacted by this Service during the consultation period.

To what extent the surrounding habitat in Grays Harbor and adjacent estuaries can absorb the displaced shorebirds and waterfowl populations is unknown but appears to be limited due to the intrinsic factors discussed above. Furthermore, peregrine falcon wintering habitat is limited in Washington with falcons showing a marked loyalty to known sites (Anderson 1981) indicating that the quality and not quantity alone may be an important consideration. Because other areas in Grays Harbor support a diverse preybase, peregrine falcons will probably still utilize Grays Harbor. However, the reduction of habitat at Bowerman Basin (up to 500 acres) and the corresponding loss of preybase will probably decrease peregrine numbers, as well as frequency and duration of use. Anderson (1981) believes any loss of known wintering habitat will result in a reduction of the peregrine falcon population. Considering the disruption of the biological mosaic at Bowerman Basin and the unknown quantitive aspects, particularly the actual total number and extent of use by the already

endangered peregrines in Grays Harbor (possibly 12 in the winter with additional birds in the fall and spring), the Service finds the cumulative effects to be significant. Therefore, the Service's opinion is that development plans for Management Unit 13 in the proposed GHEMP as presented in the biological assessment of November 24, 1980, is likely to jeopardize the continued existence of the peregrine falcon (both listed subspecies).

We are also of the opinion that the alternatives presented in the OCZM January 6, 1981 correspondence may jeopardize the continued existence of the peregrine falcons (both listed subspecies). Because of the unknown parameters involved with this alternative (i.e., total area and placement of fill, timing of construction, and hydrologic patterns in Units 12 and 13), OCZM cannot insure that their actions will not violate Section 7(a) of the Endangered Species Act. However, if appropriately constructed, the preybase for the peregrine falcons could be protected not only in Unit 13 but in Unit 12 as well.

Reasonable and Prudent Alternatives

The 1978 amendments to the Endangered Species Act include a mandate that "reasonable and prudent alternatives" be suggested when a biological opinion indicates jeopardy to a listed species. Reasonable and prudent alternatives refer to alternative courses of action open to the Federal agency with respect to an activity or program that are technically capable of being implemented and consistent with the intended primary purpose of the activity or program. We believe either of the two following alternatives, if implemented, will avoid jeopardy to the species.

1. Confine the area and direction of water-dependent development to the south side of Bowerman Field out to the navigation channel then east. Maintain the existing protection and low-level human disturbance being offered on Moon Island (Bowerman Field). This would exclude filling and development in Bowerman Basin and Unit 12. All fill materials should be free of pesticide residues.

OR

2. The following recommendations relate to the alternative offered by the OCZM in the January 6, 1981 addendum to the biological assessment. All should be implemented as part of this reasonable and prudent alternative should it be the decision of the Task Force and OCZM to pursue development in Management Unit 12.

A. Filling should not occur on the north side of Bowerman Field, within Bowerman Basin nor west of the Hoquiam City limits. Any extension of Moon Island (Bowerman Field) should not connect with Little Moon Island, i.e., leave a channel between the two. The present low-intensity disturbance associated with Bowerman Field should be maintained, as well as the protective buffer strip along the north side of Bowerman Field, the north side of the proposed development, and at the east end of Bowerman Basin.

B. All fill materials used in conjunction with this alternative should be free of pesticide residues.

C. Studies should be implemented to determine the natural productivity of the area west of Moon Island (Bowerman Field) and to determine the most acceptable time-frame for fill and construction activities. In conjunction with this, hydrologic studies should be conducted to determine present and future suspected current and sediment transfer and deposition conditions. These hydrologic studies are needed to assure that a change in existing landforms will not modify tidal exchange and flushing; and subsequently water quality, rate and direction of sediment deposition, and sediment size. Adverse changes of these unquantified parameters could impact shorebird feeding and roosting habitat.

D. Studies to monitor invertebrate productivity, shorebird use, and peregrine falcon use of Grays Harbor with emphasis on Units 12 and 13 should be conducted before, during and after construction in order to assess the impacts or significant changes that may occur. This would facilitate redirection of development should substantial declines in productivity, shorebird and peregrine falcon utilization occur. Shorebird and peregrine studies should include marking and possibly telemetry work to assess the predator-prey relationship, origin and migration routes of peregrines and utilization of Grays Harbor by both shorebirds and peregrines.

E. If feasible, depending on the results of the above studies, create new feeding and roosting habitats in Unit 12 to replace those lost to development.

F. Once a development plan is forthcoming, assess proposed industrial activities as to their compatibility with shorebird and peregrine falcon utilization. The consultation process should remain open with opinions being rendered and allowed development occurring in a stepwise manner as allowed under Section 7(a)(2) of the Act.

Conservation Measures

Sections 2(c) and 7(a)(1) of the Endangered Species Act require Federal agencies, in consultation with the Service, to utilize their authorities to carry out programs for the conservation of listed species. In this case, "conservation" means to take actions to assure the recovery of the species. We believe that the Office of Coastal Zone Management has the opportunity to fulfill this mandate by considering the following course of action.

OCZM should continue active involvement in estuarine planning both in Grays Harbor and other coastal areas supporting peregrines. Within the context of GHEMP, OCZM and the Task Force could make one of its planning goals, the recovery of the peregrine falcon. This would necessitate that the peregrine be given equal consideration when developing, revising or updating the plan, and may require shifting locations for planned development. To adequately consider the survival needs of the peregrine in Grays Harbor, studies (as described in Item D above) will be required.

Summary

In summary, we believe that implementation of the reasonable and prudent alternatives would eliminate the jeopardy opinion for the original GHEMP and the "may jeopardize" opinion associated with the alternative plan while furthering the intent of Sections 2(c) and 7(a)(1) of the Act. Consideration and implementation of the conservation measures as the plan of development would not jeopardize the continued existence of the peregrine falcon and would further the intent of Section 7(a)(1) by enhancing the possibilities of recovery for the peregrine falcon.

We prefer to keep the consultation process open as allowed under Section 7(a)(2) of the Act. It can be of an informal nature until step-wise studies are completed and development plans put forth. This would require intermediate formal consultation and biological opinions for each phase of study completion and project development. This suggestion is premised on the assumption that your agency will continue the planning process with these recommendations in mind and will concur with continuing consultation, both formal and informal. If your decision is to not continue consultation at this time, we recommend reinitiating the formal consultation procedures if the proposal is significantly modified or if new information is learned about the peregrine falcon that could change the conclusions of this opinion. Reinitiation of the consultation process could occur in conjunction with the GHEMP Task Force's annual or five-year review of the plan.

We appreciate your cooperation and assistance in meeting our joint responsibilities under the Endangered Species Act of 1973, as amended and are cognizant of the difficulties in formulating a plan with so many diverse concerns and interests. We look forward to continuing to work closely with your agency on the Grays Harbor Estuary Management Plan.

Sincerely,

Joseph R. Blum
Area Manager

JRB/jlr

Attachments

cc: Regional Director

REFERENCES

Anderson, C.M. 1981. Personal communication. Bellevue, WA.

Anderson, C.M., and P.M. DeBruyn. 1979. Behavior and ecology of peregrine falcons wintering on the Skagit Flats, Washington. Contract #WDG-PF-79-1. 53 p.

Dobler, F. 1980 and 1981. Personal communication. Washington Department of Game, Olympia, WA.

Gerstenberg, R.H. 1979. Habitat utilization by wintering and migrating shorebirds on Humboldt Bay, California. Studies in Avian Biology No.2:33-40.

Herman, S.G. 1981. Personal communication. The Evergreen State College, Olympia, WA.

Herman, S.G., and C.M. Anderson. 1981. The peregrine falcon at Grays Harbor, Washington (draft manuscript).

Gill, R. 1981. Personal communication. U.S. Fish and Wildlife Service, Anchorage, AK.

Goss-Custard, J.D. 1979. Effect of habitat loss on the numbers of overwintering shorebirds. Studies in Avian Biology No.2:167-177.

Hunt, W.G., R.R. Rogers, and D.J. Slowe. 1975. Migratory and foraging behavior of peregrine falcons on the Texas coast. The Canadian Field Naturalist, 89:111-123.

Jehl, J.R., Jr. 1979. Summarizing remarks, Part 1. Studies in Avian Biology No.2:179-181.

Jurs, L. 1978. Peregrine falcon recovery effort in Alaska. *In:* Peregrine falcon populations in North America. Eds. P. Schoeffer and S. Ehlers. Western Audobon Society. Tiberon, CA. 67 p.

Office of Coastal Zone Management. 1980. Biological assessment for Endangered Species Act section 7 consultation. 34 p.

Office of Coastal Zone Management. 1981. Addendum to biological assessment for Endangered Species Act section 7 consultation, Grays Harbor, WA. 4 p.

APPENDIX G

REVITALIZATION POTENTIALS ON THE GRAYS HARBOR WATERFRONT,
"Use and Development on the Urban Waterfront," Chapter 2,
Grays Harbor Regional Planning Commission, 1982

CHAPTER TWO

USE AND DEVELOPMENT OF THE URBAN WATERFRONT

2.1 INTRODUCTION

Any urban waterfront rehabilitation program must be based upon the economic character of its region and the locational requirements of the industries which use the region's waterfront. This chapter will explore those facets of the use and development of the Aberdeen/Hoquiam/Cosmopolis waterfront. As such, it will focus particularly on the lumber and wood products industry which has accounted for the development of both the region and the urban waterfront. Indeed, it was the juxtaposition of the immense timber resources along with the access to low cost transportation afforded by waterfront sites that is responsible for the development of the region. While this locational advantage accounts for the waterfront development and hence its major opportunities for redevelopment, it also is responsible for many of the problems that this study seeks to address. While optimum sites for the lumber and wood products industry are still in waterfront areas, the changing site requirements of that industry has also resulted in dramatic changes in the specific type of sites the industry required. This has led to the abandonment of older mills and development of new mills in previously undeveloped areas. These changes have left behind the blight which may be found on the waterfront. Since many of these older sites are no longer suitable for lumber and wood manufacturing (assuming that resource management agencies would not allow substantial expansion of these sites into the adjacent water areas; see sections 1.2 and 3.3), this chapter will also explore the use requirements of other economic activities which may be possible alternatives.

2.2 LUMBER AND WOOD PRODUCTS AND THE WATERFRONT

2.2.1 Location of the Forest Products Industry in Grays Harbor County

The forest products industry is and always will be the most significant user of the urban waterfront. A cursory examination of the location of forest products firms in Grays Harbor County readily indicates that most of the industry is concentrated along the shoreline of the estuary. Approximately 70 to 80 percent of the employees engaged in forest products manufacturing are employed near the waterfront in Aberdeen and Hoquiam. This concentration is especially apparent in the pulp and paper sector (all three firms, employing 1,814 people in 1972, are located near the estuary). Approximately 80% of the sawmill employment is located near the Harbor as is over 50% of the plywood and veneer employment. Shake and shingle processing is scattered throughout the county, but several of these plants are also found near the waterfront. This total share of forest products employment represents approximately 20 to 25% of the total non-agricultural private sector employment in the county. Of course all of the employment engaged in exporting forest products is also located directly on the waterfront.

A definite relationship has been noted between the size of firm and location. The firms which are larger, with greater capital investment and public facility requirements tend (though not completely) to be located near the bay. Smaller firms on the other hand take a more random distribution.

2.2.2 Importance of the Estuary Sites for Industrial Uses

The estuary plays a vital role as a transportation facility involved in the exportation of regional products. However, the above data also indicates that a considerable proportion of the forest products manufacturing capacity which may not be related (or is only marginally related) to waterborne transportation is also located on the shores of the bay.

There appear to be two basic reasons for this occurrence:

1. Available Flat Land. Standards used for industrial locations generally specify that quality industrial sites cannot exceed a slope of more than 6%. Topographical information reveals that most of this land in the county is either adjacent to the estuary or within the floodplains of the river valleys. In the immediate vicinity of Aberdeen and Hoquiam this land is found near the estuary. Consequently, industry in its search for suitable sites naturally tended to utilize estuary locations.

2. Historical. While much of today's forest products industrial production is not now dependent on water transportation, historically this was not always the case. During the early development of the forest products industry overland transportation systems were quite primitive and not capable of the efficient transport of industrial materials and products. Consequently the forest products industry relied heavily on water transportation to bring logs to the mills and ship the finished products to markets.

These two factors still appear to be the major influence over industrial location. The availability of flat land suitable for industrial activity has become, if anything, more restricted with time, as many of the flat areas have filled with other forms of urban uses which also require flat land. Presently almost all of the land with slopes of less than 12% and which is not located on the waterfront in Aberdeen, Hoquiam or Cosmopolis is firmly committed to non-industrial uses.

The continued development of industrial uses along the waterfront has generally lead to an almost complete orientation of industrial services to these sites. Such services include: the rail systems, the roads, the industrial water supply, the sanitary services, and the electrical distribution system. Only those plants which do not require or depend on a high level of these services can utilize other locations.

In order to locate where these services are not provided, large capital investments would be needed to extend the services. Such capital may in many cases find better investment opportunities elsewhere. Also the efficiency of providing services of the necessary magnitude would be impaired if two separate location patterns (one oriented to water dependent uses and another oriented to non-water dependent areas) had to be served. It would also be questionable economically in an area the size of Grays Harbor.

Related to the present orientation of services, is the factor of linkages. Industrial activities frequently depend on, or utilize other industrial activities as sources of materials. Location, then, in proximity to other industries, which are either suppliers or users, is another important concern (especially

when bulk volumes are involved). The forest products industry has many such linkages since many different types of products can be derived from logs or various part of logs; examples include:

1. Plywood and sawmills provide chips for pulp and paper manufacturing.

2. Pulp and paper manufacture produce a range of by-products suitable for other activities.

3. Logs vary in suitability for different processes. Access to a variety of processes ensures maximum use.

4. A range of industrial services for equipment manufacture and service are associated with the forest product industry.

In these linkages, considerable diseconomies are produced when plants cannot locate near one another, and the greater the distance, the greater the diseconomies.

Similarly, materials flows are a concern. When material has a wide variety of potential uses, considerable economies may be provided by flexibility of use. As logs flow into the Grays Harbor area they can be readily diverted to the use that maximizes the greatest market potential at any given time. The present locational pattern provides that they can readily go into export, pulp/paper, lumber, or plywood. This advantage lessens with distance between the possible processors.

Perhaps the most significant of all locational factors is the site of the transportation network. Sites where transportation routes come together offer the opportunity to combine materials from many locations into shipment to a few locations. In this area, forest products are brought in by a road and highway network which focuses on Aberdeen/Hoquiam. Aberdeen/Hoquiam serves as a convenient central place for the collection of logs from most of the Washington coastal ares.

Another important aspect of material flows is the need to transfer material from one mode to another. This "break in bulk" offers the opportunity to process material without incurring additional handling expenses. Where more than one mode joins this opportunity exists. In addition, each mode of transport has economic advantages and disadvantages in relation to each other. Generally truck transport is more competitive for state and regional markets, rail for national markets, and water for international markets. The flexibility to use the most competitive mode to serve the market that at any one time has the greatest potential, serves as a significant locational advantage.

All of these factors provide a set of potentials for the use of estuary sites, and hence a concentration of economic activity there. A forced change from these advantages could significantly reduce these potentials, or at best require much larger capital investments to achieve. Such increased costs reduce this region's competitiveness with other regions, and thereby reduce the potential range of economic activity.

While there are decided economic advantages related to the location of industry on the waterfront there are also some disadvantages to locating this

activity elsewhere. These include:

1. The development of necessary public facilities and transportation would stimulate land uses in new areas, contributing to urban sprawl.

2. Such uses would probably require conversion of agricultural land.

3. Almost all potential sites are located in flood plain areas, requiring some sort of modification for protection.

4. All such sites are well outside of incorporated places; this reduces the ability to provide necessary public facilities.

5. Such development will reduce the visual amenities of rural areas and increase the potential for land use conflicts.

Whether industry locates on the waterfront or not also depends on the attributes of these sites in comparison to other regions where similar urban areas have developed the infrastructure necessary to support industry. The regional comparative advantages for industrial locations consists of availability of the resource (timber), and access to the waterborne transportation. Since the raw material can be transportated considerable distance once loaded on a truck or rail car, the access to water transport along with the other modes is particularly significant and will probably be the most important siting consideration for a processing firm which would locate in the region. Consequently, most industries locating here would be water related, if not water dependent.

2.2.3 Locational Concerns Related to Water Dependent Forest Products Activities

In addition to the influences encouraging the location of industrial activity in general, there are specific concerns related to the location of firms engaged in water transportation activities.

Many of these are obvious, such as a log export activity which cannot be located anywhere else. However, questions may arise regarding the location of activities which are much less apparent.

While the other activity which completely requires a waterfront location (i.e. cannot be located in any other location) is the loading of ships, substantial economies can be realized if the ancilliary activities leading up to the loading also occur near the site where ships will be loaded. In the case of log exports, adequate storage and sorting areas facilitate ship loading by providing flexibility. When storage and sorting facilities are separated from loading areas logistic problems of communications, transport, and timing arise increasing costs. In the case of loading finished products, processing plants near the terminal eliminate the need to load and unload trucks between the plant and the docks. It also permits easier diversion of logs appropriate for export from logs entering the plant.

2.2.4 Changes in Historical Requirements

While the economy of the area has and will require extensive use of the urban waterfront for processing and transshipment of lumber and wood products, this industry has changed and will continue to change dramatically in terms of the types of sites it requires for efficient and competitive operation.

Aberdeen/Hoquiam's heyday of lumbering actually occurred during the 1920's; with 1929's harvest being the largest in the County's history. As the harvest boomed so did the development of processing and transshipment facilities to handle that harvest. The location of these facilities originally was dependent on the most practical way of moving logs before the advent of the logging truck, rafting logs down rivers to the area where lumber schooners could access. Mills, docks, and wharfs then located at places where the logs, rafts, and lumber schooners came together. As these activities developed, so did houses for the workers, followed by stores and other commercial services. In Grays Harbor's case the place where the most schooners and logs came together was at the confluence of the Chehalis, Wishkah and Hoquiam Rivers, accounting for the development of the Cities of Aberdeen, Hoquiam, and Cosmopolis. It is interesting to note that the population peak of the County (prior to 1970) occurred in 1930, the census year nearest the peak harvest year of the County (1929). The populations of Aberdeen and Hoquiam still have not surpassed this population peak.

Aberdeen and Hoquiam also, at this time, developed a significant ship building industry; building lumber schooners to ship the harvest. While Aberdeen and Hoquiam were the focus of this activity, some type of log handling or transshipment facility occurred at the mouth of almost every stream in the harbor; accounting for the remains of pilings and other structures throughout the estuary.

Mills and shipping facilities in those days were very small by today's standards, due to by a variety of factors including small ships and inefficient, labor intensive saws and milling equipment. The site area needed for these facilities was quite small consisting of just enough room to accommodate the mill or dock itself. No land space was required to handle logs since logs were moved, stored, and sorted in the water.

Since the 20's this has all changed. The changes came slowly but surely over the years and were due to a variety of influences.

First, much of the easily accessible old growth was exhausted. This coupled by the depression of the 1930's lead to extensive mill closures.

When the industry started coming back after the depression, it was of a different character. Rail transportation became more competitive with water transportation fordomestic markets. Mills were larger due to improved and more efficient milling procedures. These mills, however, were still tied to the water since log rafting was still the most efficient way of transporting, storing, and sorting logs. The pattern of mill sites consisted then of a tide water mill receiving logs from the water backed by rail services to move the lumber. A large dock also was often involved to give the mill the flexibility of ocean transport of timber as well. The two pulp mills were developed during this period on a similar pattern. Often the lumber mills were basically expansions of the older and smaller facilities. Since land landward of the rail lines was not needed to serve these mills, the rail line served as a border for industry, with the upland area committed to commercial or residential uses. Consequently, by today's standards these "larger" mills of the harbor developed on relatively constrained sites with little back up area.

Perhaps the most significant challenge to this pattern of production resulted from increases in the efficiency of land transportation and handling

of logs, coupled with the advent of water quality standards limiting the use of aquatic areas for log transport, storage, and handling.

As road systems developed further and further into forests, log handling equipment in the forests became more capable of rapid loading. The log truck became more competitive with log rafting. Similarly, large log handling vehicles made land sorting and storing more economical. In spite of these advances, water transport and handling is still more efficient and probably would be more heavily used today if it were not for the water quality programs and regulations which are directed at removing logs from the water. While some water handling still occurs, where no practicable alternative exists, this activity is minor compared to the 1950's.

At the same time, changes in milling technology resulted in greater economies for land intensive mill sites. Mills became less compact and more spread out.

The combination of these influences made it increasingly difficult and expensive to operate mills on the constrained sites that characterized the harbor. The mills needed larger areas for log storage, log sorting, and to accommodate the movement of larger trucks, etc.

While these pressures were strong, they took hold gradually. Since mills were built they had a capital investment which would be costly to replace. Thus, many mills continued with the inefficiencies--continuing to struggle for permits for water handling, relying on inefficient off-site log yards for storage and sorting, etc. However, with each cycle of poor market conditions which characterize the industry, fewer and fewer mills survived. To illustrate the problem, in the last five years an oldwaterfront mill closed which occupied approximately 25 acres. During this period, a modern computerized mill employing a similar number of people opened on approximately 80 acres.

Similar trends were occurring in marine terminals, perhaps more rapidly since they involved less capital investment. A few large centralized marine terminals now have taken the place of a wide variety of smaller facilities. These trends are likely to continue.

If lumber or wood products facilities are to utilize the waterfront area, they will require larger areas of land. These generally are not present where the older mills were located without expansion of those sites into the water by filling.

2.3 ADDITIONAL POTENTIAL WATERFRONT USES

The types of activities which have used the waterfront, other than lumber and forest products, were quite limited. Historically they consist primarily of ship building, commercial fishing and processing, and oil receiving and storage. Also, several other large marine commerce potentials and heavy industrial uses have been suggested for the harbor. More recently commercial activities have been locating in these areas. There should also be increased opportunities for public access and use of the waterfront in the future. The present locations of these uses are illustrated in Section 3.5.3 and the specific potentials for various sites are considered in Chapter Four. This Section will provide a general overview of these activities and their overall relationship to urban waterfront.

2.3.1 Ship Building and Repair

In the past the Grays Harbor area was a major ship building center and boat building and repair activities continue in Hoquiam. While the channel depth and available sites limit the potential of the harbor for large ship building and repair activities, it does continue to have ability to efficiently accommodate smaller boat builders and repair yards. The realization of this potential is primarily dependent on the area's ability to attract these activities. While this use can economically locate here, there are many competing areas--including the Westport area. This use is particularly appropriate for some of the smaller industrially oriented sites that remain. Because of the extensive use of fiberglass and resins in hull construction and repair, boat construction and repair yards must be carefully sited to prevent odors and fumes from impacting nearby uses.

2.3.2 Commercial Fishing and Seafood Processing

Historically, the Aberdeen/Hoquiam/Cosmopolis area has supported a significant level of activity in this industry. The largest facility was located at the old fish base in Hoquiam. While most of these activities have now shifted to Westport and to a much lesser extent Ocean Shores, some nodes of fish and seafood processing remain, near the mouth of the Wishkah River and along the Hoquiam River. The waterfront on one hand is locationally disadvantaged for this activity in its distance from the harbor's mouth relative to Westport, but on the other hand it has an advantage in being closer to the market for seafood products. Generally, as compared to Westport the disadvantages outweigh the advantages. This is not to say that the current fish processing may not expand and other factors may alter the balance. For example, the competitive balance may change slightly with further development of bottom fishing where access to the market (potentially by air) is particularly important. As in the case of boat building and repair, the potential for attracting this activity is limited. This industry has a further limitation at present in that it has difficulty in attracting investment due to the problems of the fishing industry.

2.3.3 General Commercial Development

Significant investment has occurred recently in a large general commercial shopping center on the waterfront. Development of this center eliminated a major blighted area located on the waterfront, illustrating the potential of such activities to remove blight. The site, however, was apparently selected by its developers due to its "ideal" location for commercial traffic flows, rather than its waterfront location. In fact, potential waterfront amenities were ignored in the center's siting and design. While this has proven to be unfortunate from an urban design standpoint, it does illustrate the lack of appeal the urban waterfront may have for potential investors in commercial development. They will tend to consider waterfront sites for their general locational aspects rather than for their waterfront amenities. Consequently, further commercial development will tend to depend on either changing this perspective, or will be limited to those sites very well situated for commercial development. The situation of the Wishkah Mall may also point to a potential hard choice for waterfront development: "should prospective waterfront developers be required to design for the waterfront amenities even if such requirements may by their potential expense reduce the competitiveness of these sites and thereby potentially maintaining blighted conditions?" In the case of the Wishkah Mall, Aberdeen apparently opted for blight removal as the priority in this trade-off.

General commercial development of the waterfront poses another concern. A new regional shopping center is just being completed in South Aberdeen. This

mall has already caused concern in the community over the future of competitiveness of both the downtown and to a lesser extent the Wishkah Mall. further general commercial development of other waterfront areas may increase this concern by adding even more floor space. Exceptions to this, however, are sites in proximity to downtown which may assist in increasing the downtown's ability to compete with the new mall. The appropriate development of the waterfront amenities through design may further enhance the potential of Aberdeen and Hoquiam's downtowns.

As the competition for commercial sales increases, amenities and images will be increasingly important. Commercial developments which carefully and sensitively incorporate waterfront amenities could have a comparative advantage over other commercial areas. Such a development may be able to capture both a significant share of the local market and attract some of the tourists traveling through the urban area. The growth in recreational shopping has been projected by the Urban Land Institute to be the fastest growing commercial sector in the 1980's. Recreational shoppers are most often attracted by unique and different shopping districts. The Aberdeen/Hoquiam waterfront has the potential to develop such a shopping district.

2.3.4 Tourist Commercial

Unlike many areas in other regions, the waterfront has never been able to attract commercial activities associated with the tourism industry. For example, there is only one restaurant on the waterfront, and no motels with a waterfront view. This appears to be related to two factors:

1. Aberdeen/Hoquiam/Cosmopolis, itself are not tourism centers. Grays Harbor tourism is focused on first the beach areas and second on the mountains. Aberdeen/Hoquiam/Cosmopolis have not been able to compete effectively with these areas.

2. The poor waterfront amenities apparently do not prove appealing to potential investors.

However, since other areas have overcome similar difficulties and have even used facilities such as waterfront restaurant/motel complexes to alleviate these problems, the local area has attempted at length to attract this type of investment. The Port of Grays Harbor has even prepared a site to accommodate such a development proposal. The site has not developed due to a combination of factors that include poor money markets and competition with other areas in the market for this type of investment. This site, however, remains a prime location for this type of investment with perhaps the best amenities available. It is expected that development will occur when investment markets improve. The City of Aberdeen is interested in a similar facility for the site of a closed mill near downtown.

2.3.5 Public Access and Recreation

Public investment in access or recreation facilities on the waterfront has not occurred to a significant degree. This is apparently due to the interest of the state in the development of the beach areas and a nearby lake, and the local communities' interest in upland areas and another lake. The waterfront generally has been a low priority concern in relation to other recreational needs. Again, this may also be related to the lower quality waterfront amenities. This attitude in the local community is changing, partly due to a

general change in attitude and due to changes in concepts related to what water amenities are, and an increase in the public awareness of the habitat these area provide. In the past few would have considered the muddy tide flats that are exposed in these areas as visually appealing. With heightened environmental awareness, their popularity is increasing and access to such areas is now being expected by the public.

Areas with views of shipping activities have always been popular. Local interest in wetland areas, seems to be focused on four particular activities: boat launching, fishing, viewing shipping activity, and river access where there are less extensive tide flats.

This interest is illustrated by the waterfront parks included in the cities' Comprehensive Parks Plans. The City of Aberdeen's Comprehensive Parks and Recreation Plan (1980) recommends the development of a waterfront park on eleven acres of City property along the Chehalis River. The City of Hoquiam's Comprehensive Park Plan (1980) recommends that the City "acquire 10 to 20 acres along either the Hoquiam, Little Hoquiam, or East Fork of the Hoquiam Rivers" for a waterfront park. The City of Cosmopolis' Comprehensive Plan (1979) and the City Parks Plan now under development recommend that a waterfront park be established at the site of the present boat launch. These parks are intended to satisfy the unmet community needs for waterfront parks identified in each of the plans.

The greatest barrier (indeed the only barrier) to such development is the lack of public funds generally. However, some level of public investment will probably be necessary to leverage private interest in commercial development and to meet the recreation needs identified in the cities' Parks Plans. Indeed public access and commercial redevelopment are mutually supportive.

2.3.6 Other Maritime Commerce

In addition to forest products related shipping there has been interest in attracting a more diversified commerce. This has been a long established goal along with industrial diversification. The Port's efforts to do this have been against the tide of port economics which generally have been in the direction of centralizing activity in a few large ports. This centralization particularly occurs in terms of general cargo where it is difficult for small ports to compete with the economies of scale, the distribution services, and the transportation systems available in large ports. The best potential for such diversification tends to be in bulk cargos where specialization is both necessary and can be developed in small ports. Currently, coal appears to be the leading opportunity followed by grains. However, the site requirements for such activities are similar to those discussed for forest products. These activities are not likely to be attracted to the old blighted mill sites because of their small size.

Oil in shipment is and has been a traditional activity at Aberdeen and Hoquiam. This has been primarily limited to oil consumed locally and this is unlikely to change since the port cannot accommodate and could not be economically developed to accommodate larger tankers. No new sites are needed to accommodate this activity.

2.3.7 Other Water Related Industry

As noted, industrial diversification has been a long sought goal of the area. However, success has been limited due to a variety of complex reasons described in detail in the region's economic development program. At present two possibilities are apparent. First is the development of offshore well rig assembly yard. A site has been rehabilitated and reserved for this purpose. Its development, however, is held off for two reasons: 1) delays in leasing of Gulf of Alaska oil fields, and, 2) the current excess supply of oil on the west coast. It is believed that this site will ultimately be developed for this activity. Since this site is on an old mill site, it is an example of redevelopment. When market conditions improve, there is an additional potential that a graving dock could be built at the old Port terminals.

Manganese nodule processing is another potential for the region, but the site requirements for this activity do not match those within the study area itself.

As a part of extensive interest in pursuing the goal of economic diversification, there is interest in attracting to the area some sort of light, diversified, "footloose" industry. Sites for such industry with the necessary infrastructure generally are not plentiful outside of waterfront areas. However, since such industries are not water dependent or water related, state and federal resource agencies may object to the use of waterfront sites.

2.3.8 Residential Uses

The most crucial rehabilitation needs are on the Chehalis Riverfront. Local land use policy has generally reserved these areas for industrial, commercial, and public uses. While it is not anticipated that this policy would change, suitability of these areas for residential uses is also quite low due to their blighted and industrial character. A very large residential development would be needed to change this character and make the Chehalis Riverfront suitable for residential development. In addition, state and federal regulatory agencies would strenuously resist residential development proposals.

The situation in many areas on the Hoquiam River and on most of the Wishkah River is quite different. In fact, the rehabilitation needs in some of these areas is related to the deterioration of residential structures. In these areas, residential development is appropriate (provided there is no alteration of aquatic areas) and may assist in adding public access.

2.4 CONCLUSION

The industry that historically has used the waterfront (lumber and wood products) has very limited potential as a source of reinvestment in the blighted areas of the waterfront. This industry will be better suited to larger areas adjacent to its required public facilities, areas that are not now developed (assuming that environmental regulations will prevent enlargement of older sites, and will allow development of the new sites as envisioned in the estuary plan).

Beyond the difficulties associated with siting forest products activities there are no readily apparent alternative uses demanding these sites. Indeed, extensive efforts of property owners and public agencies to attract uses have not been successful. Consequently, unlike situations which may be present in

other waterfront areas, the problem confronting rehabilitation is not what use to choose for a site, the problem is how to attract a use for many of these sites given their current physical and regulatory constraints. There are a few water dependent uses that do have some potential to be attracted to these blighted sites; notably boat building and repair, seafood handling, and oil well rig assembly. These potentials, however, are very site specific (such as oil well rig assembly) or have insufficient potential to meet most of the rehabilitation needs. Consequently, the remaining potentials are either water related uses or uses that are not water oriented. The most significant of these uses are public access and parks, and commercial activities which may be enhanced by waterfront locations. The most significant barriers to these developments are:

1. The blighted condition and low aesthetic quality of many sites discourage these activities.

2. Limited investment potential; both public and private.

3. Competition with nearby areas with similar and often greater potential.

Blighted conditions are an especially significant barrier in attracting investment in commercial activities since the blight on adjacent properties must also be removed to attract investment. This can only be overcome by either large scale private commercial development or public investment. Since attracting large scale investment will be particularly difficult, some sort of public action will be necessary to remove this barrier and encourage redevelopment.

APPENDIX H

LIST OF TECHNICAL TEAM MEMBERS

AND

INDIVIDUALS INTERVIEWED

Appendix H - 1. Composition of the Grays Harbor Estuary Team

MANAGEMENT TECHNICAL TEAM

Member	Technical Discipline	Agency/Group
Gene Deschamps	Fishery Biologist	Washington Department of Fisheries
Jack Smith	Wildlife Biologist	Washington Department of Game
Bill Lucas	Hydraulic Engineer	Corps of Army Engineers
Ron Merila	Civil Engineer	City of Aberdeen
Bob Herman	Water Quality	Weyerhauser Co.
Ron Pine	Water Quality	Department of Ecology
Gerald Pelton or Ken Bowring	Recreation	Interagency Committee for Outdoor Recreation
Al Springer	Soils	Grays Harbor Conservation District
Stan Lattin	Planner	Port of Grays Harbor
Rich Hirschberg	Forester	ITT Rayonier, Inc.
Patrick L. Dugan	Regional Economics	Grays Harbor Regional Planning Commission
Bob Goodwin	Marine Economics/ Port Development	Institute of Marine Studies

Appendix H - 2.

Personal Interviews Conducted During the Grays Harbor Estuary Management Inventory

Contact Person	Interest Represented
Nancy Thomas	Audubon Society (Tacoma)
David Ortman	Friends of the Earth (Seattle)
Robert Lentz	Poggie Club (Fish and Wildlife Group)
Frank J. Youkoff	Poggie Club (Fish and Wildlife Group)
Carol F. Agee	Poggie Club (Fish and Wildlife Group)
Bonnie Gilovich	Rain Forest Chapter of Audubon Society President
Florence Bailey	Grays Harbor Bird Club
Liz Greenhagen	General Environmental Concerns
Bill Detrick	Bar Pilot - Westport
Karl Wallin	Port of Grays Harbor Property Manager
Lois Meyer	Ocean Shores Community Club
Wes Peterson	City of Aberdeen Parks Director
Dr. Murray Johnson	University of Puget Sound Museum of Natural History
Mr. Steve Jeffries	University of Puget Sound Professor Emeritus
Lew Messmer	Grays Harbor Community College Botanist
Jim Phipps	Grays Harbor Community College
Jim Smith	Grays Harbor Community College
Eugene Schermer	Grays Harbor Community College

Al Pearson	Coast Oyster Company
Mike Lent	Coast Oyster Company
Brady Engvell	Commercial Oysterman
Wally Hendrickson	Gillnetters
H.A. Phillips	Gillnetters
L.A. Lytle	Gillnetters
Mark Cedergreen	Westport Charter Association
Frank Synder	Charter Boat Fisherman
Harold Hardy	(Westport City Engineer)
Jim Dart	Fish Processor
Al Lundgren	Bay Fish Company
Leif Anderson	Washington Crab Producers Co.
Arnie Sandlen	Grays Harbor Chamber of Commerce, President
George Douglas	Aberdeen Chamber of Commerce, Manager
W.F. Pierson	Twin Harbor Stevedoring Co., Vice-President & General Manager
Bill Marks	Ocean Shores Chamber of Commerce, President
Ed Bowers	Interstate Asphalt Co,
Len Nordell	Enterprises International (Chief Exec.)
Bob Ingram	E.C. Miller Lumber Co.

Tom Quigg	Quigg Bros. - McDonald
Rusty Johnson	Weyherhaeuser Co., Vice-President, Public Relations
Bob Bracken	Graystone of Grays Harbor
Phil Roderick	Phil-Rod Company
Ted Holand	Union Oil Distributor
Don Stedman	(Commercial Fisherman)
Hank Soike	Port of Grays Harbor, Manager
Tom Wagner	Ocean Spray, Inc. Manager
Lynn Daneker	Grays Harbor County Labor Council
Jack McGuire	Mayor of Hoquiam
Phil Bolton	Mayor of Ocean Shores
Bill McDeavitt	City Manager Ocean Shores
Doug Hoflin	Public Works Director of Oceanshores
Bill Wade	Mayor of Westport (and Commercial Fisherman)
Dick Smith	Director of Public Works for Westport
Gary Yando	Planning Director, Grays Harbor County
Rolland Youmans	County Commissioner
Ken Clay	Transportation Authority (Past Ferry Service Oper.)

Dick Moulton	Grays Harbor County Extension Agent
Al Boileau	Mayor of Cosmopolis
Walt Bussard	Mayor of Montesano
Shelby Warren Hill	Rancher, Point New
Mr. Prickett	Montesano
Mr. Clemens	Montesano
Doug McGoon	Department of Natural Resources.
Bob Coykendall	Department of Natural Resources
Bill Stewart	Daily World, Assistant Editor

APPENDIX I

SPECIES LIST

SOURCE: Westhave Cove (Westport Marina) Small Boat Basin Expansion Draft Environmental Impact Statement, U.S. Army Corps of Engineers, August 1978

SPECIES LIST

The following lists species found in Grays Harbor. The general characteristics of the habitats are briefly described in conjunction with the bird and mammal lists for convenience. In addition to notes on habitat, notes on feeding habits, seasonal migrations and abundance are provided for those species.

Habitat. Four general categories are used to describe the diverse array of bird and mammal habitats. These four habitats have been coded in the list as follows:

RS-Rocky Shore Marine Habitat. These rocky outcrops within the intertidal area are constantly washed by tides and waves.

SM-Salt Marsh, Mud Flat and Sand Flat Habitats. Habitat "SM" includes highly productive marsh grasslands, mud flats, and sand flats, all of which are strongly influenced by marine water.

FM-Freshwater Marsh and Meadow. This habitat category includes upland meadows and marshlands influenced only by freshwater. Also included in this category is lowland riparian, shrubs, and thickets and borad-leaved woodland.

OG-Open Water in Grays Harbor. This category includes open water and the large water surface within Grays Harbor.

Feeding Habits. A notation of feeding habits is given for each species based on the type or types of food the animal customarily depends on. There are fundamentally three major classes of food items:

1 - Class 1 foods are the vegetative parts of plants such as leaves, stalks, bark, and twigs. Animals dependent on these food classes are adapted to consuming large quantities of low-energy value foods, which are regularly available. Many class 1 consumers also take class 2 foods when available.

2 - Class 2 foods are the storage parts of plants such as

roots, bulbs, tubers, seeds, and fruits. Animals dependent on class 2 food sources are adapted to seeking a food which is irregularly or seasonally abundant and therefore depend upon a variety of plants. Some class 2 consumers also take class 1 and 3 foods.

3 - Class 3 food items include all animal matter such as small birds, mammals, reptiles, amphibians, fish, insects, and other high protein food sources. Animals dependent on class 3 food items are adapted for obtaining high energy value foods which are difficult to capture.

Seasonality. Most birds of Grays Harbor are migrants, spending the spring, fall or winter in the harbor. The seasonal occurrence of the species, including mammals, is abbreviated as follows:

R - Resident: this species is present throughout the year.

S - Summer visitor with seasonal presence extending into spring and fall.

W - Winter visitor with seasonal presence extending into spring and fall.

M - Migrant: present only during spring and fall months.

F - Present only during fall months.

Abundance. The term "abundance" refers to the number of individuals of a particular species in a particular habitat area. The notations used to indicate abundance are shown under the habitat type columns and are abbreviated as follows:

C - Common: Present within appropriate habitat in season and may be seen by trained observers on most visits to area in question.

U - Uncommon: Present within appropriate habitat in season but usually not seen by trained observers on every visit to area in question.

R - Rare: Present only in small numbers in the appropriate habitat in season and seldom seen by trained observers.

The following list of bird and mammal species has been prepared on the basis of habitat types and a knowledge of species which frequent such habitats. An extensive list of species was prepared by Dr. Gordon Alcorn of the University of Puget Sound, and presented in "Grays Harbor and Chehalis River Navigation Project, Operation and Maintenance EIS," June 1975. Dr. Alcorn's list was used in conjunction with the Washington Environmental Atlas[1/] to develop the bird list which was reviewed and corrected by members of the State Department of Game and the Rain Forest Chapter of the Audubon Society. The lists for benthic invertebrates and fishes were derived from the Dredging Effects Study data.

1/U.S. Army Corps of Engineers District, Seattle, Washington, Washington Environmental Atlas, January 1975.

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
GAVIIDAE							
Common Loon	Gavia immer	-	C	C	C	3	R
Yellow-billed Loon	Gavia adamsii	-	R	-	R	3	W
Arctic Loon	Gavia arctica	-	C	C	C	3	W
Red-throated Loon	Gavia stellata	-	C	C	C	3	W
PODICIPEDIDAE							
Red-necked Grebe	Podiceps grisegena	-	C	U	C	3	W
Horned Grebe	Podiceps auritus	-	C	U	C	3	W
Eared Grebe	Podiceps nigricollis	-	C	C	C	3	W
Western Grebe	Aechmorphorus occidentalis	-	C	C	C	3	W
Pied-billed Grebe	Polilymbus podiceps	-	C	C	U	3	W
PROCELLARIIDAE							
Sooty Shearwater	Puffinus griseus	-	C	-	C	3	S
PELECANIDAE							
Brown Pelican	Pelecanus occidentalis californicus	-	R	-	R	3	F
PHALACROCORACIDAE							
Double-crested Cormorant	Phalacrocorax auritus	-	C	U	C	3	R
Brant's Cormorant	Phalacrocorax penicillatus	-	C	-	C	3	R
Pelagic Cormorant	Phalacrocorax pelagicus	-	C	-	C	3	R
ARDEIDAE							
Great Blue Heron	Ardea herodias	C	C	C	-	3	R
Green Heron	Butorides virescens anthonyi	-	R	U	-	3	R
Great Egret	Casmerodius albus	-	U	U	-	3	S
American Bittern	Botaurus lentiginosus	-	U	C	-	3	S
ANATIIDAE							
Whistling Swan	Olor columbianus	-	U	U	-	1	W
Trumpeter Swan	Olor buccinator	-	U	U	-	1	W
Canada Goose	Branta canadensis	-	C	C	C	1	M
Black Brant	Branta nigricans	C	C	-	C	1	M
Emperor Goose	Philacte canagica	-	R	-	-	1	W
White-fronted Goose	Anser albifrons	-	U	U	-	1	M
Mallard	Anas platyrhynchos	-	C	C	U	1&2	R
Gadwall	Anas strepera	-	C	C	U	1&2	W
Pintail	Anas acuta	-	C	C	U	1&2	R
Green-winged Teal	Anas crecca	-	C	C	U	1&2	W
Blue-winged Teal	Anas discors	-	U	U	-	1&2	M
Cinnamon Teal	Anas cyanoptera	-	U	U	-	1&2	M
European Wigeon	Mareca penelope	-	R	R	-	1	W
American Wigeon	Mareca americana	-	C	C	-	1	R
Northern Shoveler	Anas clypeata	-	C	C	-	1	R
Wood Duck	Aix sponsa	-	C	C	-	1&2	W
Redhead	Avthya americana	-	R	R	-	1&2	W

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
Ring-necked Duck	Aythya collaris	-	R	R	-	1&2	W
Canvasback	Aythya valisineria	-	U	U	-	1&2	W
Greater Scaup	Aythya marila	-	C	U	-	2&3	R
Lesser Scaup	Aythya affinis	-	C	C	-	3	R
Common Goldeneye	Bucephala clangula	-	C	C	-	3	W
Barrow's Goldeneye	Bucephala islandica	-	C	C	-	3	W
Bufflehead	Bucephala albeola	-	C	C	-	3	W
Oldsquaw	Clangula hyemalis	-	R	R	-	3	W
Harlequin Duck	Histrionicus histrionicus	-	U	U	U	3	R
White-winged Scoter	Melanitta deglandi	-	C	C	-	3	R
Surf Scoter	Melanitta perspicillata	C	C	U	C	3	R
Black Scoter	Melanitta nigra	-	U	-	U	2	W
Ruddy Duck	Oxyura jamaicensis	-	U	-	U	3	W
Hooded Merganser	Lophodytes cucullatus	-	C	C	U	1&2	W
Common Merganser	Mergus merganser	-	U	C	R	3	R
Red-breasted Merganser	Mergus serrator	-	U	C	C	3	W
CATHARTIIDAE							
Turkey Vulture	Cathartes aura	U	U	U	-	3	S
ACCIPITRIDAE							
Sharp-shinned Hawk	Accipiter striatus	-	U	U	-	3	R
Cooper's Hawk	Accipiter cooperii	-	U	U	-	3	R
Red-tailed Hawk	Buteo jamaicensis	-	U	C	-	3	R
Rough-legged Hawk	Buteo lagopus sanctijohannis	-	U	U	-	3	S
Bald Eagle	Haliaeetus leucocephalus alascanus	-	U	U	-	3	R
Marsh Hawk	Circus cyaneus hudsonius	-	C	C	-	3	R
PANDIONIDAE							
Osprey	Pandion haliaetus carolinensis	-	U	U	-	3	R
FALSONIDAE							
Prairie Falcon	Falco maxicanus	R	R	R	-	3	W
Peregrine Falcon	Falco peregrinus	R	R	R	-	3	W
Merlin	Falco columbarius	-	U	U	-	3	R
American Kestrel	Falso sparverius sparverius	-	U	U	-	3	R
TETRAONIDAE							
Ruffed Grouse	Bonasa umbellus	-	R	C	-	1&2	R
PHASIANIDAE							
California Quail	Lophortyx californicus	-	R	C	-	1&2	R
Ring-necked Pheasant	Phasianus colchicus	-	U	C	-	1&2	R
GRUIDAE							
Sandhill Crane	Grus canadensis	-	U	U	-	2&3	M

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
RALLIDAE							
Virginia Rail	Rallus limicola	-	U	U	-	2&3	R
Sora	Porzana carolina	-	R	R	-	1&3	S
American Coot	Fulica americana	-	C	C	C	2&3	R
HAEMATOPODIDAE							
Black Oystercatcher	Haematopus bachmani	C	-	-	-	3	R
CHARADRIIDAE							
Semipalmated Plover	Charadrius semipalmatus	-	U	U	-	3	S
Snowy Plover	Charadrius alexandrinus nivosus	-	U	-	-	3	S
Killdeer	Charadrius vociferus	C	C	C	-	3	R
American Golden Plover	Pluvialis dominica	-	U	R	U	3	W
Black-bellied Plover	Pluvialis squatarola	-	C	U	-	3	W
SCOLOPACIDAE							
Ruddy Turnstone	Arenarius interpres	U	C	C	-	3	M
Black Turnstone	Arenarius melanocephala	U	C	C	-	3	W
Common Snipe	Capella gallinago delicata	-	U	C	-	3	R
Long-billed Curlew	Numenius americanus parvus	-	R	R	-	3	S
Whimbrel	Numenius phaeopus	-	C	C	-	3	M
Spotted Sandpiper	Actitis macularia	-	C	C	-	3	M
Wandering Tattler	Heteroscelus incanus	C	U	-	-	3	M
Willet	Catoptrophorus semipalmatus	-	R	R	-	3	M
Greater Yellowlegs	Tringa melanoleuca	-	C	C	-	3	M
Lesser Yellowlegs	Tringa flavipes	-	C	C	-	3	M
Surfbird	Aphriza virgata	-	-	-	C	3	W
Red Knot	Calidris canutus	C	C	-	-	3	M
Rock Sandpiper	Calidris ptilocnemis	U	-	-	U	3	F
Sharp-tailed Sandpiper	Calidris acuminata	R	-	-	-	3	F
Pectoral Sandpiper	Calidris melanotos	-	C	C	-	3	M
Baird's Sandpiper	Calidris bairdii	-	U	C	-	3	M
Least Sandpiper	Calidris minutilla	-	C	C	-	3	W
Dunlin	Calidris alpina	-	C	U	-	3	M
Semiplated Sandpiper	Calidris pusilla	-	R	R	-	3	W
Western Sandpiper	Calidris mauri	-	C	C	-	3	F
Sanderling	Calidris alba	-	C	U	-	3	W
Short-billed Dowitcher	Limnodromus griseus	-	C	R	-	3	M
Long-billed Dowitcher	Limnodromus scolopaceus	-	C	C	-	3	M
Stilt Sandpiper	Micropalama himantopus	-	R	R	-	3	M
Buff-breasted Sandpiper	Tryngites subruficollis	-	R	-	-	3	M
Marbled Godwit	Limosa fedoa	-	R	R	-	3	M

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
PHALAROPODIDAE							
Red Phalarope	Phalaropus fulicarius	-	R	-	U	3	M
Wilson's Phalarope	Steganopus tricolor	-	U	C	-	3	M
Northern Phalarope	Lobipes lobatus	-	U	C	C	3	M
STERCORARIIDAE							
Parasitic Jaeger	Stercorarius parasiticus	-	-	-	C	2&3	M
Pomarine Jaeger	Stercorarius pomarinus	-	-	-	C	2&3	M
Long-tailed Jaeger	Stercorarius longicaudus	-	-	-	R	2&3	M
Skua	Catharacta skua	-	-	-	R	2&3	M
LARIDAE							
Glaucous Gull	Larus hyperboreus	-	R	R	R	2&3	W
Glaucous-winged Gull	Larus glaucescens	C	C	U	-	2&3	R
Western Gull	Larus occidentalis	C	C	-	C	2&3	R
Herring Gull	Larus argentatus	-	C	U	C	2&3	W
Thayer's Gull	Larus thayeri	-	C	-	C	2&3	W
California Gull	Larus californicus	-	C	C	C	2&3	R
Ring-billed Gull	Larus delawarensis	-	U	C	U	2&3	R
Mew Gull	Larus canus	-	C	C	C	2&3	M
Franklin's Gull	Larus pipixcan	-	R	R	R	2&3	F
Bonaparte's Gull	Larus philadelphia	-	C	C	C	2&3	W
Herrmann's Gull	Larus heermanni	-	C	-	C	2&3	W
Black-legged Kittiwake	Rissa tridactyla	-	-	-	C	2&3	W
Sabine's Gull	Xema sabini	-	-	-	U	2&3	M
Forster's Tern	Sterna forsteri	-	R	U	R	2&3	M
Common Tern	Sterna hirundo	-	C	C	-	2&3	M
Arctic Tern	Sterna paradisaea	-	R	-	U	2&3	M
Caspian Tern	Hydroprogne caspia	-	C	U	-	2&3	S
ALCIDAE							
Common Murre	Uria aalge	C	-	-	C	3	R
Pigeon Guillemot	Cepphus columba	C	-	-	C	3	R
Marbled Murrelet	Brachyramphus marmoratus	-	-	C	C	3	R
Xantus' Murrelet	Endomychura hypoleuca	-	-	-	U	3	F
Ancient Murrelet	Synthliboramphus antiquus	-	-	-	C	3	W
Cassin's Auklet	Ptychoramphus aleuticus	-	-	-	C	3	R
Parakeet Auklet	Cyclorrhynchus psittacula	-	-	-	R	3	W
Rhinoceros Auklet	Cerorhinca monocerata	-	-	-	C	3	R
Horned Puffin	Fratercula corniculata	-	-	-	R	3	R
Tufted Puffin	Lunda cirrhata	-	-	-	C	2	S
COLUMBIDAE							
Band-tailed Pigeon	Columba fasciata monilis	-	-	C	-	2	S
Rock Dove	Columba livia	-	-	C	-	2	S
Mourning Dove	Zenaida macroura marginella	-	-	U			

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
TYTONIDAE							
Barn Owl	Tyto alba pratincola	-	-	U	-	3	R
STRIGIDAE							
Screech Owl	Otus asio	-	-	R	-	3	R
Great Horned Owl	Bubo virginianus	-	U	C	-	3	R
Snowy Owl	Nyctea scandiaca	R	R	R	-	3	W
Pygmy Owl	Glaucidium gnoma	-	R	R	-	3	R
Burrowing Owl	Speotyto cunicularia hypugaea	-	U	U	-	3	R
Spotted Owl	Strix occidentalis caurina	-	-	R	-	3	R
Great Gray Owl	Strix nebulosa nebulosa	-	-	R	-	3	W
Long-eared Owl	Asio otus	-	-	U	-	3	R
Short-eared Owl	Asio flammeus	-	U	U	-	3	R
Saw-whet Owl	Aegolius acadicus	-	U	U	-	3	R
CAPRIMULGIDAE							
Common Nighthawk	Chordeiles minor	-	C	C	-	3	S
APODIDAE							
Black Swift	Cypseloides niger	-	?	?	-	3	S
Vaux's Swift	Chaetura vauxi	-	-	C	-	3	S
TROCHILIDAE							
Anna's Hummingbird	Calypte anna	-	-	C	-	2&3	W
Rufeous Hummingbird	Selasphorus rufus	-	-	C	-	2&3	S
Calliope Hummingbird	Stellula calliope	-	-	C	-	2&3	M
ALCEDINIDAE							
Belted Kingfisher	Megaceryle alcyon	-	C	C	-	3	R
PICIDAE							
Common Flicker	Colaptes auratus	-	-	C	-	2&3	R
Pileated Woodpecker	Dryocopus pileatus	-	-	U	-	2&3	R
Yellow-bellied Sapsucker	Sphyrapicus varius	-	-	R	-	2&3	R
Hairy Woodpecker	Dendrocopos villosus	-	-	C	-	2&3	R
Downy Woodpecker	Dendrocopos pubescens	-	-	C	-	2&3	R
TYRANNIDAE							
Willow Flycatcher	Empidonax traillii	-	-	C	-	3	S
Hammond's Flycatcher	Empidonax hammondii	-	-	C	-	3	S
Western Flycatcher	Empidonax difficilis	-	-	C	-	3	S
Western Wood Pewee	Contopus sordidulus	-	-	U	-	3	S
Olive-sided Flycatcher	Nuttallornis borealis	-	-	U	-	3	S
ALAUDIDAE							
Horned Lark	Eremophila alpestris	-	-	U	-	3	W
HIRUNDINIDAE							
Violet-green Swallow	Tachycineta thalassina	-	U	C	-	3	A
Tree Swallow	Iridoprocne bicolor	-	-	C	-	3	S

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
Barn Swallow	Hirundo rustica	-	U	C	-	3	S
Cliff Swallow	Petrochelidon pyrrhonota	-	-	C	-	3	S
Purple Martin	Progne subis subis	-	U	C	-	3	S
CORVIDAE							
Gray Jay	Perisoreus canadensis	-	-	U	-	2&3	R
Stellar's Jay	Cyanocitta stelleri	-	R	C	-	2&3	R
Common Raven	Crovus corax	U	U	U	-	2&3	R
Common Crow	Corvus brachyrhynchos	C	C	C	-	2&3	R
PARIDAE							
Black-capped Chickadee	Parus stricapillus	-	-	C	-	2&3	R
Mountain Chickadee	Parus gambeli	-	-	R	-	2&3	R
Chestnut-backed Chickadee	Parus rufescens	-	-	U	-	2&3	R
Bushtit	Psaltriparus minimum	-	-	C	-	2&3	R
SITTIDAE							
White-breasted Nuthatch	Sitta carolinensis	-	-	C	-	2&3	R
Red-breasted Nuthatch	Sitta canadensis	-	-	U	-	2&3	R
CERTHIIDAE							
Brown Creeper	Certhia familiaris	-	-	U	-	3	R
CINCLIDAE							
Dipper	Cinclus mexicanus	-	-	C	-	3	R
TROGLODYTIDAE							
House Wren	Troglodytes aedon	-	-	C	-	3	S
Winter Wren	Troglodytes troglodytes	-	U	C	-	3	R
Bewick's Wren	Thryomanes bewickii	-	-	C	-	3	R
Long-billed Marsh Wren	Telmatodytes palustris	-	-	C	-	3	R
TURDIDAE							
American Robin	Turdus migratorius	C	C	C	-	3	R
Varied Thrush	Ixoreus naevius	-	-	C	-	3	R
Hermit Thrush	Catharus guttatus	-	-	C	-	3	R
Swainson's Thrush	Catharus ustulatus	-	-	C	-	3	S
Western Bluebird	Sialia mexicana occidentalis	-	-	U	-	3	S
Townsend's Solitaire	Myadestes townsendi	-	-	U	-	3	R
SYLVIIDAE							
Golden-crowned Kinglet	Regulus satrapa	-	-	C	-	3	R
Ruby-crowned Kinglet	Regulus calendula	-	-	C	-	3	R
MOTACILLIDAE							
Water Pipit	Anthus spinoletta	-	-	C	-	3	M
BOMBYCILLIDAE							
Bohemian Waxwing	Bombycilla garrulus	-	-	C	-	3	W
Cedar Waxwing	Bombycilla cedrorum	-	-	C	-	3	R
LANIIDAE							
Northern Shrike	Lanius excubitor	-	U	U	-	3	W
STURNIDAE							

BIRDS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habits	Seasonality
Starling	Sturnus vulgaris	U	C	C	-	3	R
VIREONIDAE							
Hutton's Vireo	Vireo buttoni	-	-	U	-	3	R
Solitary Vireo	Vireo solitarius	-	-	U	-	3	S
Red-eyed Vireo	Vireo olivaceus	-	-	C	-	3	S
Warbling Vireo	Vireo gilvus	-	-	C	-	3	S
PARULIDAE							
Orange-crowned Warbler	Vermivora celata	-	-	C	-	3	S
Yellow Warbler	Dendroica petechia	-	-	C	-	3	S
Yellow-rumped Warbler	Dendroica coronata	-	-	C	-	3	S
Black-throated Gray Warbler	Dendroica nigrescens	-	-	C	0	3	S
Townsend's Warbler	Dendroica townsendi	-	-	C	-	3	S
MacGillivray's Warbler	Oporornis tolmiei	-	-	C	-	3	S
Common Yellowthroat	Geothlypis trichas	-	-	C	-	3	S
Wilson's Warbler	Wilsonia pusilla	-	-	C	-	3	S
PLOCEIDAE							
House Sparrow	Passer domesticus	-	-	C	-	3	R
ICTERIDAE							
Western Meadowlark	Sturnella neglecta	-	-	C	-	2&3	R
Red-winged Blackbird	Agelaius phoeniceus	-	C	C	-	2&3	R
Brewer's Blackcird	Euphagus cyanocephalus	-	-	C	-	2&3	R
Brown-headed Cowbird	Molothrus ater	-	-	C	-	2&3	S
THRAUPIDAE							
Western Tanager	Piranga ludoviciana	-	-	C	-	2	S
FRINGILLIDAE							
Evening Grosbeak	Hesperiphona vespertina	-	-	C	-	2	R
Purple Finch	Carpodacus purpureus	-	-	C	-	2	R
House Finch	Carpodacus mexicanus	-	-	C	-	2	R
Pine Siskin	Spinus pinus	-	-	C	-	2	R
American Goldfinch	Spinus tristis	-	U	C	-	2&3	R
Rufous-sided Towhee	Pipilo erythrophthalmus	-	-	C	-	2	R
Savannah Sparrow	Passerculus sandwichensis	-	-	C	-	2&3	R
Dark-eyed Junco	Junco hyemalis	-	-	C	-	2&3	S
Chipping Sparrow	Spizella passerina	-	-	C	-	2	S
Golden-crowned Sparrow	Zonotrichia atricapilla	-	-	C	-	2	W
Lincoln's Sparrow	Melospiza lincolnii	-	-	C	-	2&3	M
Fox Sparrow	Passerella iliaca	-	-	C	-	2&3	R
Song Sparrow	Melospiza melodia	-	-	C	-	2&3	M
Lapland Longspur	Calcarius lapponicus	-	-	C	-	2&3	R
Snow Bunting	Plectrophenax nivalis	-	U	C	-	2&3	W

MAMMALS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habit	Seasonality
DIDELPHIDAE (ORDER MARSUPIALTA)							
Virginia opossum	Didelphis virginiana	-	C	C	-	2+3	R
SORICIDAE (ORDER INSECTIVORA)							
Masked shrew	Sorex cinereus	-	-	U	-	2+3	R
Trowbridges shrew	Sorex trowbridge	-	-	R	-	2+3	R
Vagrant shrew	Sorex vagrans	-	C	C	-	2+3	R
Dusky shrew	Sorex obscurus	-	-	U	-	2+3	R
Northern water shrew	Sorex palustris	-	-	U	-	3	R
Marsh shrew	Sorex bendirei	-	C	C	-	3	R
TALPIDAE							
Shrew mole	Neurotrichus gibbsi	-	U	U	-	2+3	R
Townsend's mole	Scapanus townsendi	-	-	U	-	2+3	R
Coast mole	Scapanus orarius	-	-	U	-	2+3	R
VESPERTILIONIDAE (ORDER CHIROPTERA)							
(Note: Data on bats in Washington are limited, and considerable controversy exists as to species. Most bats in the state can be found in both eastern and western Washington. Probably most of the more common species would be found in the Grays Harbor area.)							
LEPORIDAE (ORDER LAGOMORPHA)							
Snowshoe Hare	Lepus americanus	-	C	C	-	1	R
APLODONTIDAE (ORDER RODENTIA)							
Aplondantia	Aplodontia rufa	-	-	C	-	1	R
SCIURIDAE							
Townsend's chipmunk	Eutamias townsendi	-	-	C	-	2	R
Chickaree	Tamiasciurus douglasi	-	-	U	-	2	R
Northern flying squirrel	Glaufomys sabrinus	-	--	U	-	2	R
GEOMYIDAE							
Western pocket gopher	Thomomys mazama	-	-	U	-	1+2	R
CASTORIDAE							
Beaver	Castor canadenisis	-	U	C	-	1+2	R
CRICETIDAE							
Deer mouse	Peromyscus maniculatus	-	C	C	-	2+3	R
Bushytail woodrat	Neotoma cinerea	-	U	C	-	2	R
Boreal redback vole	Clethrionomys gapperi	-	-	C	-	1+2	R
Townsend vole	Microtus townsendi	-	-	C	-	1+2	R
Longtail vole	Microtus longicandus	-	U	U	-	1+2	R
Oregon vole	Microtus oregoni	-	-	C	-	1+2	R
Muskrat	Ondatra zibethica	-	C	C	-	1	R
ZAPODIDAE							
Pacific jumping mouse	Zapus trinotatus	-	U	C	-	2	R
ERETHIZONTIDAE							
Porcupine	Erethizon dorsutum	-	-	C	-	1	R
MYOCASTORIDAE							
Nutria	Myocastor caypus	-	U	U	-	1	R

MAMMALS Common Name	Scientific Name	Habitat Type RS	SM	FM	OG	Feeding Habit	Seasonality
DESOGUBUDAE (ORDER CETACEA)							
Striped porpoise	Stenella caerulevalba	-	-	-	U	3	R
Common dolphin	Delphinus delphas	-	-	-	U	3	R
Killer whale	Orcinus orca	-	-	-	C	3	R
Harbor porpoise	Phocoena phocoena	-	-	-	C	3	R
ESCHRICHTIDAE							
Gray Whale	Eschrichtius robustus	-	-	-	U	3	M
URSIDAE (ORDER CARNIVORA)							
Black bear	Ursus americanus	-	-	R	-	1,2 &3	R
PROCYONIDAE							
Racoon	Procyon lotor	C	C	C	-	2+3	R
MUSTELIDAE							
Shorttail weasel	Mustela erminea	-	U	U	-	3	R
Longtail weasel	Mustela frenata	-	U	U	-	3	R
Mink	Mustela vision	C	U	C	-	3	R
River otter	Lutra canadensis	U	R	R	-	3	R
Spotted skunk	Spilogak putorius	-	-	C	-	2+3	R
Striped skunk	Mephitis mephitis	-	-	C	-	2+3	R
CANIDAE							
Coyote	Canis latrans	-	U	C	-	2+3	R
Common red fox	Vulpes vulpes fulva	-	-	U	-	2+3	R
FELIDAE							
Mountain lion	Felis concolor	-	-	R	-	3	R
Bobcat	Lynx rufus	-	-	U	-	3	R
OTARIIDAE (ORDER PINNIPEDIA)							
Steller sea lion	Eumetopias jubatus	-	-	-	U	3	M
PHOCIDAE							
Harbor seal	Phoca vitulina richardi	C	C	-	C	3	R
Elephant seal	Miroungu angustirostria	R	R	-	R	3	M
CERVIDAE (ORDER ARTIODACTYLA)							
Columbia blacktail deer	Odocoileus hemionus columbianus	R	U	C	-	1	R

PARTIAL SPECIES LIST OF BENTHIC INVERTEBRATES FOR GRAYS HARBOR
1974-1975

CTENOPHORA
- Nuda
  - *Beroe sp.* ?

NEMERTEA
- Enopia
  - Heteronemertea
    - *Amphiporus sp.* 1 (imparispinosis?)
    - *Amphiporus sp.* 2
    - *Paranemertes sp.*

ACANTHOCEPHALON
- Found in fish stomachs (starry flounder)
- Found attached to *Corophim stimpsoni*

ANNELIDA
- Oligochaeta
  - Tubificidae
    - *Peloscolex gabriellae*
  - Enchytraeidae
    - *Enchytraeus sp.* 1
    - *Enchytraeus sp.* 2
  - Naididae
    - *Naididae sp.* 1
  - Polychaeta
    - Arenicolidae
      - *Abarenicola pacificia*
    - Ampharetidae
      - *Amphicteis mucronata*
      - *Anobothrus gracilis*
    - Capitellidae
      - *Capitella capitata*
      - *Capitellid* '6'
      - *Heteromastus filiformis*
      - *Mediomastus californiensis*
      - *Notomastus tenuis*
    - Cirratulidae
      - *Cirratulus sp.*
    - Goniadidae
      - *Glycinde armigera*
    - Nephtyidae
      - *Nephtys caeca*
      - *Nephtys ferruginea*
    - Nereidae
      - *Nereis brandti*
      - *Nereis sp.*
      - *Nereis vexillosa*
      - *Nereis virens*

Orbiniidae
- *Haploscolopolos sp.*
- *Scolopolos armiger*

Ophelidae
- *Armandia bioculata*
- *Ophelia assimilis*

Phyllodocidae
- *Eteone longa*

Polynoidae
- *Harmothoe imbricata*
- *Hesperonoe complanata*

Sabellidae
- *Fabricia sabella*
- *Manayunkia sp.*

Sigalionidae
- *Pholoe minuta*

Spionidae
- *Polydora ligni*
- *Pseudopolydora kempi japonica*
- *Pygospio elegans*
- *Pygospio sp.*
- *Rhyncospio arenicola*
- *Spio filicornis*
- *Spiophanes sp.*
- *Streblospio benedicti*

Syllidae
- *Brania brevipharyngea*
- *Sphaerosyllis pirifera*
- *Syllis sp.*
- *Trypanosyllis sp.*
- *Unidentified Syllidae*

MOLLUSCA

Pelecypoda

Eulamellibranchia

Cardiidae
- *Clinocardium nuttallii*

Mactridae
- *Tresus capax*

Myidae
- *Mya arenaria*
- *Cryptomya californica*

Ostreidae
- *Crassostrea gigas*

Solenidae
- *Siliqua patula*

Tellinidae
- *Macoma inconspicua*
- *Macoma nasuta*
- *Tellina nuculoides (salmonea)*

Veneridae
Protothaca staminea
Tapes japonica
Saxidomas giganteus
Filibranchia
Mytellidae
Modiolus rectus
Mytilus californianus
Mytilus edulis
Gastropoda
Nacticidae
Polinices draconis
Nassariidae
Nassarius perpingus
ECHINODERMATA
Asteroidea
Pisaster ochraceus
ARTHROPODA
Crustacea
Ostracoda
Unidentified ostracod
Copepoda
Clausidium vancouverensis
Diaptemous sp.
Cirripedia
Thoracica
Balanus glandula
Lepas anatifera
Rhizocephala
Unidentified genus: Parasitic on Corophium
Unidentified genus: Parasitic on Callianassa
May be Ellobiopsid
Malacostraca
Pericarida
Mysidaces
Archaeomysis grevnitzskii
Mysis oculata?
Neomysis mercedis
Cumacea
Eudorella sp.
Eurodorella sp.
Diastylis sp.
Lamprops, Hemilamprops, or Mesoprops sp.
Leptocuma sp.
Tanaidaces
Leptochelia savignyi
Pancolus californiensis

- Isopoda
  - Valvifera
    - *Idotea* (*Idotea*) *fewkesi*
    - *Idotea* (*Idotea*) *rufescens*
    - *Idotea* (*Penidotea*) *resecata*
    - *Idotea* (*Penidotea*) *wosnesenskii*
    - *Saduria entomon*
  - Flabellifera
    - *Aegidae sp.*
    - *Cirolana kincaidi*
    - *Gnorismosphaeroma oregonensis*
  - *Epicaridea*
    - *Argeia pugettensis*
    - *Bopyrus sp.*
  - Oniscoidea
    - *Lygidia palsaii*
- Amphipoda
  - Gammaridea
    - *Allorchestes angusta*
    - *Amphithoe sp.*
    - *Anisogammarus confervicolus*
    - *Ceradocus spinicaudus*
    - *Corophium acherusicum*
    - *Corophium oaklandense*
    - *Corophium spinicorne*
    - *Corophium stimpsoni* (later identified as *C. salmonis*)
    - *Dogielinotus loquax*
    - *Eohaustorius sp.*
    - *Hyale ancepts*
    - *Mandibulophoxus gilesi*
    - *Orchestia traskiana*
    - *Orchestoidea pugettensis*
    - *Orchomene pacifica*
    - *Paraphoxus milleri*
    - *Photis brevipes*
    - *Pontogeneia inermis*
  - Caprellidea
    - *Caprella borealis*
    - *Caprella californica*
    - *Caprella incisa*
- Eucarida
  - Decapoda
    - Natantia
      - Caridea
      - Crangonidae
        - *Crangon alba*
        - *Crangon franciscorum*
        - *Crangon nigricauda*
- Reptantia
  - Astacura
    - Thallasinoidea
      - Callianassidae

Callianassa californiensis
Upogebia pugettensis
Brachyura
Brachygnatha
Brachyrhyncha
Cancer magister
Cancer oregonensis
Cancer productus
Hemigrapsus nudus
Hemigrapsuoregonensis
Insecta
Collembola
Arthropleona
Anurida Maritima
Diptera
Aphrosylus sp.
Saunderia sp.
HEMICHORDATA
Enteropneusta
Unidentified genus

SOURCE: Appendix E, Maintenance Dredging and the Environment of Grays Harbor.

SPECIES COMPOSITION OF FISHES IN GRAYS HARBOR

Petromyzontidae - lampreys
- *Pacific lamprey - Lampetra tridentata

Squalidae - dogfish sharks
- Spiny dogfish - Squalus acanthias

Rajidae - skates
- Big skate - Raja binoculata

Acipenseridae - sturgeons
- White sturgeon - Acipenser transmontanus
- Green sturgeon - Acipenser medirostris

Clupeidae - herrings
- American shad - Alosa sapidissima
- Pacific herring - Clupea harengus pallasi
- Pacific sardine - Sarinops sagax

Engraulidae - anchovies
- Northern anchovy - Engraulis mordax

Salmonidae - salmon, trout, and char
- Chum salmon - Oncorphynchus keta
- Coho salmon - Oncorphynchus kisutch
- *Chinook salmon - Oncorphynchus tshawytscha
- *Cutthroat trout - Salmo clarki
- *Steelhead trout - Salmo gairdneri
- Dolly Varden - Salvelinus malma

Osmeridae - smelts
- Surf smelt - Hypomesus pretiosus
- Longfin smelt - Spirinchus dilatus
- *Eulachon - Thaleichthys pacificus

Cyprinidae - minnows
- *Peamouth - Mylocheilus caurinus
- Northern squawfish - Ptychocheilus oregonensis

Gadidae - codfishes
- Pacific tomcod - Microgadus proximus

Atherinidae - silversides
- Topsmelt - Atherinops affinis affinis

Gasterosteidae - sticklebacks
- Threespined stickleback - Gasterosteus aculeatus

Syngnathidae - pipefishes
- Bay pipefish - Syngnathus griseolineatus

Embiotocidae - surfperches
- Redtail surfperch - Amphistichus rhodoterus
- Shiner perch - Cymatogaster aggregate
- Striped seaperch - Embiotoca lateralis
- Walleye surfperch - Hyperprosopon argenteum
- Silver surfperch - Hyperprosopon ellipticum
- White seaperch - Phanerodon furcatus
- Pile perch - Rhacochilus vacca

Pholidae - gunnels
- Saddleback gunnel - Pholis ornata

Ammodytidae - sand lances
- Pacific sand lance - Ammodytes hexapterus

Gabiidae - gobies
- Arrow goby - Clevelandia ios

Hexagrammidae - greenlings
- Kelp greenling - Hexagrammos decagrammus
- Masked greenling - Hexagrammos octogrammus
- Lingcod - Ophiodon elongatus

*Scorpaenidae - rockfishes
- Black rockfish - Sebastodes melanops

Cottidae - sculpins
- *Prickly sculpin - Cottus asper
- Pacific staghorn sculpin - Leptocottus armatus
- Padded sculpin - Antedius fenestrailis
- Buffalo sculpin - Enophrys bison
- Cabezon - Scorpaenichthys marmoratus

Stickaeidae - pricklebacks
- Snake prickleback - Lumpenus sagitta

Agonidae - poachers
- Sturgeon poacher - Agonus acipenserinus
- Wartysea poacher - Occa verrucosa

Cyclopteridae - lumpfishes and snailfishes
- Blacktail snail fish - Careproctus melanurus

Bothidae - lefteyed flounders
    Pacific sanddab - Citharichthys sordidus

Pleuronectidae - righteyed flounders
    English sole - Parophyrys vetulus
    Starry flounder - Platichthys stellatus
    Sand Sole - Psettichthys melanostictus

*taken by Deschamps and Wright (1970) but did not appear in 1973 sampling.

Source: Appendix G, Maintenance Dredging and the Environment of Grays Harbor.

APPENDIX B. Plant Species by Zone/Community of Grays Harbor

Dune and Winter Pond Zone

Salt Spray Community

Ammophila arenaria	Beachgrass
Cakile edentula	American searocket
Elymus mollis	American dune grass
Fragraria chiloensis	Coastal strawberry
Lathryus japonicus	Beach pea
Sedum spp.	Stonecrop
Vicia spp.	Vetch

Dune Community

Long-leaved grass

Ammophila arenaria	European beach grass
Anaphalis margaritacea	Pearly everlasting
Elymus mollis	American dune grass
Fragaria chiloensis	Coastal strawberry
Lathyrus japonicus	Beach pea
Lupinus littoralis	Seashore lupine

Short-leaved grass

Agrostis spp.	Bentgrass
Aira praecox	Little hairgrass
Ammophila arenaria	Beachgrass
Anaphalis margaritacea	Pearly everlasting
Antennaria spp.	Pussey-toes
Elymus mollis	American dune grass
Fragraria chiloensis	Coastal strawberry
Gaultheria shallon	Salal
Gnaphalium purpureum var. purpureum	Purple cudweed
Hypochaeris glabrata	Smooth cats-ear

APPENDIX B Continued

Hypochaeris radicata	Hairy cats-ear
Lupinus littoralis	Seashore lupine
Myrica californica	California waxmyrtly
Picea sitchensis	Sitka spruce
Pinus contorta	Lodgepole pine
Plantago maritima	Seaside plantain
Poa macrantha	Seashore bluegrass
Rumex salicifolius	Narrow-leaved dock
Salix hookeriana	Coast willow
Solidago apathulata var. spathulata	Dune goldenrod
Tanacetum douglasii	Western tansey
Vaccinium ovatum	Evergreen huckleberry

Unstable Sand (much bare sand)

Abronis latifolia	Sandverbina
Ammophila arenaria	Beach grass
Anaphalis margaritacea	Pearly everlasting
Antennaria spp.	Pussey-toes
Arctostaphylos uva-ursi	Kinnikinnick
Cardionema ramosissima	Sandmat
Elymus mollis	American dune grass
Fragraria chiloensis	Coastal strawberry
Glehnia lelocarpa	Glehnia
Hypocaeris glabrata	Smooth cats-ear
Hypochaeris radicata	Hairy cats-ear
Lupinus littoralis	Seashore lupine
Plantago maritima	Seaside plantain
Polygonum aponuchia	Knotweed
Sedum spp.	Stonecrop
Solidago spathulata var. spathulata	Dune goldenrod
Tanacetum douglasii	Western tansey

APPENDIX B Continued

Winter Pond Community

Rush-sedge-grass-willow-waxmyrtle-pearly everlasting-aster

Agrostis spp.	Bentgrass
Aira praecox	Little hairgrass
Ammophila arenaria	Beachgrass
Anaphalis margaritacea	Pearly everlasting
Aster subspicatus	Douglas aster
Botrychium multifidium	Leathery graphe fern
Carex lyngbyei	Lyngby's sedge
Carex macrocephala	Large-headed sedge
Carex obnupta	Slough sedge
Cerastium arvense	Field chickweed
Cirsium spp.	Thistle
Cuscuta subinclusa	Dodder
Epilobium spp.	Epilobium
Fragraria chiloensis	Coastal strawberry
Hypochaeris glabrata	Smooth cats ear
Hypochaeris radicata	Hairy cats-ear
Juncus spp.	Rush
Juncus Balticus	Baltic rush
Juncus lesuerii	Salt-rush
Lonicera spp.	Bush honeysuckle
Mentha spp.	Mint
Myrica californica	California waxmyrtle
Orthocarpus castillejoides	Owl clover
Pinus contorta	Lodgepole pine
Plantago lanceolata	English plantain
Pontentilla anserina	Common silverweed
Rannunculus flammula	Creeping buttercup
Rumex acetosella	Sourweed

APPENDIX B Continued

Rumex occidentalis	Western Dock
Rumex salicifolius	Narrow-leaved dock
Salix hookeriana	Coast willow
Sisyrinchium californica	Yellow-eyed grass
Spiranthes romanzoddina	Ladies-tresses
Spirea douglasii	Douglas spirea
Trifolium pratense	Red clover
Trifolium repens	White clover
Trifolium wormskjoldii	Spring bank clover
Triglochin maritimum	Seaside plantaon

Forest Zone

Pinus contorta Community

Ammophila arenaria	Beachgrass
Anaphalis margaritacea	Pearly everlasting
Arctostaphylos uva-ursi	Kinnikinnick
Aster subspicatus	Douglas aster
Carex obnupta	Sloughsedge
Elymus mollis	American dune grass
Fragraria chiloensis	Coastal strawberry
Gaultheria shallon	Salal
Goodyera oblongifolia	Rattlesnake plantain
Heracleum lanatum	Cow-parsnip
Hypochaeris glabrata	Smooth cats-ear
Hypochaeris radicata	Hairy cats-ear
Myrica californica	California waxmyrtle
Picea sitchensis	Sitka spruce
Pinus contorta	Lodgepole pine
Ulex europaeus	Gorse
Vaccinium ovatum	Evergreen huckleberry

Picea sitchensis-Pinus contorta Community

Achillea millefolium	Yarrow
Anaphalis margaritacea	Pearly everlasting

APPENDIX B Continued

Gaultheria shallon	Salal
Hypochaeris glabrata	Smooth cats-ear
Hypochaeris radicata	Hairy cats-ear
Myrica californica	California waxmyrtle
Picea sitchensis	Sitka spruce
Pinus contorta	Lodgepole pine
Polystichum munitum	Sword fern
Pseudotsuga menziesii	Douglas-fir
Rubus spectabilis	Salmonberry
Tsuga heterophylla	Western hemlock
Vaccinium ovatum	Evergreen huckleberry
Vaccinium parviflorum	Red huckleberry

Picea sitchensis-Tsuga heterophylla Community

Abies amabilis	Silver fir
Abies grandis	Grand fir
Acer circinatum	Vine maple
Acer macrophyllum	Big leaf maple
Achillea millefolium	Yarrow
Alnus rubra	Red alder
Anaphalis margaritacea	Pearly everlasting
Athyrium filix-femina	Lady fern
Blechnum spicant	Deer fern
Carex obnupta	Slough sedge
Chaenactus douglasii	False yarrow
Cytisus scoparius	Scotch broom
Fraxinus oregona	Oregon Ash
Galium spp.	Bedstraw
Gaultheria shallon	Salal
Lycopodium spp.	Club moss
Mianthemum bifolium	Wild Lilly of the Valley
Mianthemum dilatatum	Beadruby
Montia sibirica	Springbeauty
Montia perfoliata	Miners lettuce
Picea sithchensis	Sitka spruce
Polypodium glycyrrhiza	Licorice fern
Polystichum munitum	Sword fern

APPENDIX B Continued

Populus trichocarpa	Northern black cottonwood
Potentilla anserina	Common silverweed
Prunella vulgaris	Self-heal
Pseudotsuga menziesii	Douglas fir
Pteridium aquilinum	Braken fern
Pyrus fusca	Western crabapple
Quercus garryana	Oregon white oak
Rhamnus purshiana	Cascara
Ribes spp.	Gooseberry
Rosa gymnocarpa	Little wildrose
Rosa nutkana	Nootka rose
Rubus parviflorum	Thimbleberry
Rubus spectabilis	Salmonberry
Rubus ursinus	Blackberry
Sambucus glavea	Blue elderberry
Sambucus racemosa	Elder
Spiranthes romanzoffina	Ladies tresses
Spirea douglasii	Douglas spirea
Taxus brevifolia	Yew
Tsuga heterophylla	Western hemlock
Vaccinium ovatum	Evergreen huckleberry
Vaccinium parviflorum	Red huckleberry

Interior Pond Zone

Winter Marsh Community

Alnus rubra	Red alder
Arnica amplexicaulis	Streambank arnica
Carex macrocephala	Large-headed sedge
Carex obnupta	Slough sedge
Carex vessicaria var. major	Inflated sedge
Equisetum spp.	Horsetail
Lansana communis	Nippleweed
Lysichitum americanum	Skunk cabbage
Oeanthe sarmentosa	Water parsley
Pyrus fusca	Western crabapple

APPENDIX B Continued

Pseudotsuga menziesii	Douglas-fir
Ranuculus flammuls	Creeping buttercup
Salix hookerina	Coast willow
Sparganium minimum	Small bur-reed
Sparganium simplex var. multipedunculatum	Common bur-reed
Spirea douglasii	Douglas spirea
Tsuga heterophylla	Western hemlock
Typha latifolia	Common cat-tail

Marsh Community

Arnica amplexicaulis	Streambank arnica
Carex macrocephalia	Large-headed sedge
Carex obnupta	Slough sedge
Carex vessicaria var. major	Inflated sedge
Deschampsia caespitosa	Tufted hairgrass
Festuca spp.	Fescue-grass
Glaux maritima	Saltwort
Lysichitum americanum	Skunk cabbage
Populus trichocarpa	Northern black cottonwood
Salix hookerina	Coast willow
Sparganium minimum	Small bur-reed
Sparganium simplex var. multipedunculatum	Common bur-reed
Spirea douglasii	Douglas spirea
Triglochin maritimum	Seaside plantain
Typha latifolia	Common cat-tail

Pond Community

Nuphar polysepalum	Yellow pondlily

Salt Marsh Community

Achillea millefolium	Yarrow
Agrostis alba	Bent grass
Atriplex patula	Goosefoot

APPENDIX B Continued

Carex lyngbyei	Lyngby's sedge
Castilleja levisecta	Indian paintbrush
Cladophora sp.	Cladophora
Cotula coronopifolia	Cotula
Cuscuta salina	Dodder
Deschampsia cespitosa	Tuffed hairgrass
Distichlis spicata	Saltgrass
Festuca rubra var. rubra	Fescue-grass
Glaux maritima	Saltwort
Grindelia integrifolia	Gumweed
Hordeum brachyantherum	Barley
Jaumea carnosa	Jaumea
Juncus balticus	Baltic rush
Liliaeopsis occidentalis	Liliaeopsis
Plantago-maritima	Plantain
Poa palustris	Bluegrass
Potentilla pacifica	Pacific silverweed
Puccinellia pumila	Alkaligrass
Ruppia maritima	Ditch-grass
Salicornia virginica	Pickleweed
Scirpus americanus	Bulrush
Scirpus cernuus	Bulrush
Spergularia canadensis	Sandspurry
Spergularia marina	Sandspurry
Stellaria humifusa	Starwort
Triglochin concinnum	Arrowgrass
Triglochin maritimum	Seaside arrowgrass
Zannichellia palustris	Horned pondweed
Zostera noltii	Eelgrass

Tidelands Zone

Salicornia virginica	Pickleweed
Zostera marina	Eelgrass
Zostera nolti	Eelgrass

☆ U.S. GOVERNMENT PRINTING OFFICE : 1983 O - 409-809