

**Washington State Coastal Zone Management
Section 309 Assessment and Strategy, 1992
Final Report**

Shorelands and Coastal Zone Management Program



**Washington Department of Ecology
May, 1992
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Shorelands and Coastal Zone Management Program
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This version of *Washington State Coastal Zone Section 309 Assessment and Strategy*, originally published in 1992, was reformatted in 2005 for republication as a part of the 2005 - 2006 coastal zone Section 309 assessment and strategy process. The original report format contained a number of redundancies which have been eliminated, along with general formatting changes to make this version more consistent in style with the 1997, 2002, and 2006 reports. No content was eliminated.

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Table of Contents

Table of Contents	iii
Summary	v
Assessment	v
Wetlands	v
Coastal Hazards	vi
Public Access	vii
Marine Debris	vii
Cumulative and Secondary Effects of Growth	viii
Special Area Management Planning	ix
Ocean Resources	x
Siting of Energy and Government Facilities	x
Priority Objectives	xi
Strategy	xi
1 • Introduction	1
2 • Public Involvement	5
3 • Improvement Objectives	7
Wetlands	8
Coastal Hazard Areas	14
Flood Hazards	14
Geologic Hazards	17
Sea Level Rise	21
Public Access	27
Marine Debris	33
Cumulative And Secondary Effects Of Growth	36
Special Area Management Plans	45
Ocean Resources	55
Siting Of Energy And Government Facilities	60
4 • Strategies	65
Introduction and Summary	65
Wetlands Strategy	65
Coastal Erosion Management Strategy	65

Public Access Strategy	80
Growth Management Strategy.....	81
Special Area Management Planning Strategy	87
5 • Fiscal And Technical Needs	91
Fiscal Needs	91
Technical Needs	92
6 • Incorporations By Reference	93
7 • Bibliography	97
Appendix A: Section 309 Questionnaire Summary Report	99
Appendix B: Section 309 Assessment Focus Groups Summary Report	103
Mount Vernon	103
Seattle	105
South Bend	106
Olympia.....	107

Summary

Assessment

The following summary of the Assessment is reprinted from the November 1991 *Coastal Currents* newsletter.

Wetlands

Washington boasts a tremendous diversity of wetlands—alpine meadows in the high Cascades; salt marshes along the Pacific coast; river mouth estuaries within Puget Sound; vernal pools and green riparian corridors in eastern Washington; floating sphagnum bogs in pothole lakes; and large areas of freshwater marsh in the Columbia Basin. Estuarine and coastal wetlands total about 248,000 acres of the total wetlands acreage of nearly 940,000 in Washington.

About a third of Washington's wetlands have been lost to filling or conversion to other uses. The loss continues at a rate of as much as 2,000 acres per year.

The threats to Washington's wetlands include direct threats such as

- Filling
- Drainage
- Dredging and stream channelization
- Discharges of deleterious materials
- Construction of dikes, dams, levees, and sea walls
- Mining of wetland soils for peat and other materials
- Vegetation removal, particularly through land clearing activities

and indirect threats such as

- Sediment production from erosion
- Introduction of exotic plant species
- Reduced groundwater exchange capacity
- Stormwater impacts from increased peak flows
- Subsidence, including natural rise of sea level
- Hydrologic impacts due to extraction of ground water
- Soil compaction, erosion, and bank destabilization from livestock grazing

No single wetlands management program exists for Washington state. The existing program is a composite of regulatory authorities available under the state Shoreline Management Act through local government Shoreline Master Programs; the federal Clean Water Act through review of Section 404 (Department of the Army) permits; the State Environmental Policy Act (SEPA) through review of environmental impact statements; and executive branch endorsement of these authorities through Governor's Executive Orders.

Existing authorities do not adequately cover wetlands less than 20 acres in surface area or riparian wetlands associated with streams of less than 20 cfs annual average flow.

Attempts were made to secure passage of a comprehensive Wetlands Management Act in the 1990 and 1989 legislatures. The legislation was not adopted.

Coastal Hazards

Coastal hazards consist of three distinct but related problems—flooding, erosion and land sliding, and sea level rise.

Tidal flooding affects specific low-lying areas along the Pacific coast and Puget Sound. A combination of high tides and riverine flood crests has also caused problems for specific low lying areas. Storm surge or coastal high hazard areas (velocity or V-zones) have been identified and mapped along the Pacific coast and for certain areas within Puget Sound. The threat is typically associated with large winter storms involving high winds and/or low pressure cells. Riverine flooding associated with high tides is a major threat for certain coastal communities both along the outer coast and within Puget Sound. The threat is differentiated between tsunamis propagated around the Pacific Rim (Alaska, Chile and Japan) and the potential for a major (magnitude 8+) subduction earthquake in the immediate offshore environment.

Geologic hazards include coastal erosion and bluff landsliding, plus threats related to seismic events. Threats related to earthquakes are poorly understood in Washington state, but appear to present a serious risk to both the Pacific Ocean coast and Puget Sound shorelines.

Rates of shoreline erosion are slow enough in much of Washington that little attention is paid to locating structures away from the shore. The general response to erosion in Puget Sound is the armoring of the shoreline, either with riprap or with concrete bulkheads and seawalls. As of the mid-1970s roughly 8% of the Puget Sound shoreline was armored, largely in urban areas, but this number has certainly increased in the last 15 years. The greatest increases have occurred along residential shorelines.

Landsliding can occur along the edges of the large estuaries of southwest Washington and along the bluffs north of Grays Harbor, but a bulk of Washington's landsliding problems are located around the Puget Lowland. Over 30% of Puget Sound's shoreline is mapped as unstable, and in some counties the percentage is much higher. Regrading or improving drainage on unstable slopes may minimize the risk from landsliding, but often these measures are not taken until after a problem has occurred. Some counties have instituted standards for building on marine bluffs, though often these rules do not in themselves prevent future landslide problems. No state policy has been developed, but technical and policy assistance is available to local governments.

Presently, existing sea level rise—about a 6 inches per century—is causing or aggravating shoreline erosion and bluff land sliding. Over a period of decades, accelerated sea level rise—a foot and a half to six feet by 2100—is expected to aggravate existing erosion and landsliding problems. Sea water intrusion of coastal aquifers, which is presently a problem on the islands of north and central Puget Sound and along Hood Canal due to ground water withdrawals, will be aggravated. Areas presently at risk of flooding will experience more frequent and more severe flooding; areas just above the flood zone now will become subject to flooding. Wetlands and possibly other low lying coastal areas will be subject to inundation.

For none of these issues is there comprehensive management, regulation, or protection of public and private investment in the shoreline. Indeed, considerable controversy has arisen in the past over how to or even whether to manage for some of these issues.

Public Access

The Washington Wildlife and Recreation Coalition stated in its 1989 report, after surveying the entire state:

Loss of public access to water is one of the most pressing outdoor recreation problems facing Washington residents in the near future. In fact, this was the most common single concern expressed to the Coalition during its statewide public meetings.

On rivers, access points for boating and fishing are limited. A number of the accesses that are currently in use are over private property where the landowner has largely ignored the activity. There is evidence of change with increasing confrontations between river users and property owners.

Access to many of our lakes is blocked by privately owned shoreline properties. In a few instances public purchase has obtained limited access to these lakes, but in general public access even to navigable lakes is severely restricted.

Washington has 2,400 miles of marine shoreline. About 300 miles are on the open ocean; the remainder is inland waters such as Puget Sound. Public Access on the outer coast is not a problem, but the adequacy of support facilities, such as public parks and developed recreation sites is generally considered to be inadequate for the growing population.

Public Access to the state's 2,100 mile inland waterway shoreline is severely limited. The best access sites are the various public parks that are located on greater Puget Sound. The capacity of these to accommodate public use is limited and turn-away crowding is common.

Two major constraints placed on the acquisition of public access are availability of public funding and a dearth of properties available for purchase. The value and scarcity of available waterfront property is such that when a property is placed on the market it is often snapped up before any public agency can initiate the cumbersome process of public acquisition. Moreover, most shoreline property sales are small lots, which do not have sufficient land area for a public recreation site.

Washington state has not been ignoring the problem. The Coastal Zone Management Program annually provides grants to local government for public access planning and acquisition. Pedestrian access floats have been constructed in LaConner, South Bend, and Raymond, and a boardwalk through the dunes at Long Beach. Public access sites have been acquired in Clallam and Wahkiakum counties and in Anacortes; wetlands have been acquired along Woodland Creek (Thurston County) and on Tarboo Bay and Skookum Inlet. Much more could be done, particularly in cooperation with the Department of Natural Resources' Aquatic Lands Enhancement Account and the Interagency Committee for Outdoor Recreation.

Marine Debris

It's easy to dismiss marine debris as an East Coast problem—they're the ones with garbage and hypodermic needles washing up on the beach.

It'd also be wrong. Washington has just as much of a marine debris problem. It's just different.

The oceans have long be thought of as the idea dumping ground. It wasn't but a few decades ago that many communities were disposing of their trash by filling tide flats. As late as the 1970s Seattle garbage was being dumped on Snohomish Delta wetlands on the Tulalip Reservation. We've come a long way and we've a ways to go yet.

Marine debris is any manufactured object accidentally or purposefully put into the marine environment. Of all debris, plastic is considered to be one of the most serious contaminants. Its properties of strength, durability, light weight, and low cost make plastic ideally suited for the manufacture of a growing number of products. These same properties also make plastic potentially harmful to the marine environment. Lightweight plastic floats, becoming widespread at sea and on beaches where it threatens marine mammals and birds by entanglement or ingestion. Other plastic sinks, but still endangers marine life and the safety of divers. The persistence of plastic presents another problem in the marine environment. Most plastic resists natural decay. Although it may break down smaller and smaller, those particles may affect the marine environment for years or even decades.

In 1988, the Commissioner of Public Lands, Brian Boyle, appointed the Marine Plastic Debris Task Force (MPDTF) to develop a state action plan to address the growing pollution problem in the waters of Washington. The Task Force developed twenty action recommendations. In 1989, the legislature passed a law directing the Department of Natural Resources to be the overall coordinating agency in order to encourage adoption and implementation of the Task Force's recommendations.

Since 1989, the Marine Plastic Debris Program has coordinated activities with other state agencies and organizations; developed educational materials for trade shows; produced curriculum guides and other children's educational materials; placed 1500 educational signs at marinas, launch ramps, and other marine public access points; distributed over 60,000 children's coloring/activity books; instituted a grants program for local jurisdictions; and participated in the funding of the Coastweeks beach cleanup projects.

Still, the Program is hampered by inadequate funding and lack of a strong regulatory authority. The challenge for the future is to acquire those strengths and move ahead in other areas such as education and recycling.

Cumulative and Secondary Effects of Growth

Any resident or regular visitor to the Puget Sound area knows the price we've paid for our growth—congested freeways, restrictions on wood burning stoves, weekend lines at the ferry landings, and higher taxes.

Growth is taking its toll on shoreline resources too. The closure of shellfish beds is becoming all too familiar. Failing septic systems, urban stormwater runoff, and dairy runoff all contribute to the bacterial contamination of shellfish habitat and the eventual contamination of the clams and oysters themselves.

The intertidal and shallow water habitats used for spawning by Pacific Herring and Surf Smelt are threatened by ordinary shoreline development throughout Puget Sound and particularly by bulkhead construction and other forms of shoreline hardening. Similarly, the shoreline shallows used by juvenile Chum and Pink Salmon on their migration out to sea are threatened.

Simple wildlife habitat in the coastal zone is becoming rare except along the Strait of Juan de Fuca and protected reaches of the ocean coast. Places like Nisqually delta and Skagit Delta have become precious largely because of the degradation or elimination of habitat values at the other major river deltas.

A coastal habitat of great concern are sandspits. Bald Eagles, Merlins, Peregrine Falcons, and Snowy Plovers are a few of the endangered, threatened, or sensitive species which use Washington's sand spits. Shorelands is just completing an inventory and characterization of sandspits and other coastal accreted landforms; few undeveloped sandspits remain.

The challenge for the future may be simply to learn how to use all the existing regulations in an efficient and orderly manner—the Shoreline Management Act, the Hydraulic Project Approval, local zoning and building codes. More likely, the challenge will be to develop some special protection for the special coastal resources.

Special Area Management Planning

All of us who use the coast have special places we are fond of—a quiet estuary, a shell fishing spot, a river delta wildlife area, a salmon fishing secret, or a sandy ocean beach. But how do we decide what areas are special in a formal sense? What criteria do we use to make the decision? And how do we go about setting up management plans?

Congress established 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, including lands likely to be affected by land subsidence, sea level rise, or fluctuating water levels of the Great Lakes, and improved predictability in governmental decision making,*” in Section 303 (3) of the Coastal Zone Management Act amendments of 1990. These special area management plans (SAMPs) as defined by Congress are to be comprehensive plans that provide “*natural resource protection and reasonable coastal-dependent economic growth containing a detailed and comprehensive statement of policies; standards and criteria to guide public and private uses of lands and waters; and mechanisms for timely implementation in specific geographic areas within the coastal zone.*”

The principal benefit to developing and using a SAMP is that it establishes a plan that local, regional, state, and federal regulatory agencies, as active participants in the SAMP process, must give consideration in their decision making processes.

Washington's coastal zone program includes a number of special area plans in the broadest sense. The Grays Harbor Estuary Management Plan is our only formal SAMP. At the local level it involves Grays Harbor County plus the cities of Aberdeen, Hoquiam, Ocean Shores, and Westport. The Padilla Bay Estuarine Research Reserve and the Washington Coast Marine Sanctuary represent another form of special area planning and designation. The Nisqually River Management Plan is a good example of a successful non-regulatory special area plan—and one which often serves as a model for other planning efforts.

The challenge for the future is to identify the various kinds of special area planning and management that are appropriate for Washington, and to identify the specific areas which would benefit from the process.

Ocean Resources

Washington's ocean resources have been and continue to be important to the people, our culture, and our economy. What would Washington be without salmon, halibut, or Dungeness crab? But there's more to ocean resources than the traditional fishery. Many persons suspect that there may be economically significant amounts of offshore oil and gas.

For many years Shorelands quietly lead the effort to keep ocean resources and offshore oil a "live" issue. Many others helped in the effort.

In May, 1989, the Washington State Legislature passed the "Ocean Resources Management Act." That Act imposed a six year moratorium on leasing Washington's marine waters for oil and gas exploration, development, or production. Additionally, the Legislature directed the Departments of Ecology and Natural Resources, for that six-year period, to complete an analysis of the potential positive and negative impacts of the leasing of state-owned lands. Unfortunately there's no adequate funding available to carry out the studies.

Currently, Washington does not have a unified "ocean program" that is conducted out of one office or agency. Rather, various state agencies operate pursuant to specific legislative and administrative mandates which address ocean issues.

The Department of Ecology has primary responsibility for oil and gas development issues and develops State policy on such issues. In developing such policy, Ecology works with various state and federal agencies, Indian Tribes, and members of the public. Additionally, Ecology is the lead agency in development of the State's position on the Western Washington Outer Coast National Marine Sanctuary.

The Department of Wildlife has jurisdiction over seabirds and shorebirds, marine mammals and game fish (steelhead trout). The Department of Fisheries has responsibility for commercial and recreational fisheries and shellfish harvesting. The Department of Natural Resources leases and manages aquatic lands and protects and manages aquatic plants (e.g. kelp). The Parks and Recreation Commission is delegated authority under the Seashore Conservation Act over certain aspects of ocean beach management.

What Washington clearly lacks is a comprehensive plan for the use of our ocean resources. This would be no simple matter—the cooperation of a number of agencies would be necessary.

Siting of Energy and Government Facilities

In 1975 the Washington legislature created a unique state agency—the Energy Facility Site Evaluation Council (EFSEC)—to oversee industry plans for the development of new oil, gas, and electrical facilities in the state.

The 13 member council includes a representative from the state departments of Agriculture; Community Development; Ecology; Fisheries; Health; Natural Resources; Trade and Economic Development; Transportation; and Wildlife; and Office of Financial Management; Parks and Recreation Commission; State Energy Office; and Utilities and Transportation Commission.

The Council's function is to consider and balance all costs and benefits of a proposed energy facility in a one-stop process, eliminating the need for a proposed project to receive multiple

permits, and avoiding duplicative review from the various agencies. This single process has streamlined siting for energy related activities by limiting site evaluation to two or three steps.

The EFSEC process has proven itself in such instances as the Northern Tier Oil Pipeline application during the late 1970s and early 1980s. At that time, though, a substantial amount of energy impact assistance funding under the Coastal Zone Management Program was available to assist local governments. This funding is no longer available, and the EFSEC process may be very different for local government confronted with the pending Trans Mountain terminal and pipeline in the near future.

The siting of major government facilities does not enjoy a tested process like EFSEC. Washington's new Growth Management Act instructs local governments to include consideration of the siting of government facilities such as solid waste disposal sites and prison facilities—the NIMBY (not in my back yard) facilities—in their new comprehensive plans. The Growth Management Act is untested yet, and its success in aiding the siting of government facilities remains to be seen.

Priority Objectives

Tentatively, Washington's priority improvement objectives are as follows (not in order of importance).

- Cumulative and Secondary Effects of Growth: at the state and local government level, the integration of Shoreline Management Act and Growth Management Act regulatory programs, particularly through critical area guidelines, procedural criteria, and natural resources of state-wide significance management.
- Coastal Hazards: address the cumulative and secondary effects of large scale shoreline armoring practices for protection from coastal erosion; address gaps in coastal flooding regulations.
- Wetlands: address gaps wetlands regulatory programs.
- Special Area Management Planning: the assessment identifies specific potential locales which appear to qualify for Special Area Management Planning; pending the clear desire on the part of the affected local governments.
- Public Access: enable local governments to develop and adopt modern comprehensive park, recreation, and public access plans in accordance with Interagency Committee for Outdoor Recreation (IAC) criteria to enable local governments to acquire IAC funds to carry out public access acquisition and improvement.

Strategy

Washington State has chosen to develop improvement strategies for wetlands, coastal erosion hazards, public access, management of effects of growth, and special area management planning. Please refer to Chapter 4, Strategies.

1 • Introduction

The federal Coastal Zone Act Reauthorization Amendments of 1990 made a fundamental change and addition to the Coastal Zone Management Act of 1972 with the creation of the Section 309 Coastal Zone Enhancement Grants program. The Section 309 amendments cite eight “improvement objectives” —

- 1 — Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands.
- 2 — Preventing or significantly reducing threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level rise.
- 3 — Attaining increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.
- 4 — Reducing marine debris entering the Nation’s coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.
- 5 — Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.
- 6 — Preparing and implementing special area management plans for important coastal areas.
- 7 — Planning for the use of ocean resources.
- 8 — Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance.

The purpose of the Section 309 enhancement grants program is to foster improvements in state coastal zone management programs in these specific areas, and thereby hopefully improvements in actual coastal zone management. State coastal zone management programs are a state-federal partnership. In exchange for adopting a coastal zone management program which meets federal criteria, states are entitled to annual coastal zone management grants for administering and implementing the approved program. The federal agency which administers the over-all program is the Office of Ocean and Coastal Resource Management (OCRM) of the National Oceanic and Atmospheric Administration (NOAA).

Program improvements are defined by OCRM as amendments to the state’s coastal zone management program. Program amendments are further defined as:

- a change in coastal zone boundaries;
- new or revised authorities, including statutes, regulations, enforceable policies, etc.;

- new or revised local coastal zone programs (in Washington state, the local Shoreline Master Programs);
- new or revised land acquisition, management, or restoration programs that attain one or more of the coastal zone enhancement objectives;
- new or revised Special Area Management Plans or plans for Areas of Special Concern;
- new or revised guidelines, procedures, or policy documents.

The potential dilemma for state and local managers, who typically have insufficient funds with which to carry out existing programs, is the added burden of administering new or expanded program elements. The challenge then, is to develop strategies for program improvements which add little or nothing to on-going operational expenses.

The Section 309 enhancement program is voluntary: states enrolled in the federal coastal zone management program, such as Washington, are encouraged but not required to participate in the Section 309 enhancement program. Failure to participate in the program, however, could result in a diminishment of total federal coastal zone management funding. Congress directed that funding for Section 309 projects be provided by diverting 10 to 20% of the basic coastal zone management funds to these special projects. Historically, full funding of the basic federal Coastal Zone Management Program has not been available. That does not appear to be an issue at least for the fiscal year 1992-93; beyond that there is uncertainty.

The first step in the Section 309 enhancement program, is the development of an assessment of the status of Washington’s current coastal zone management program with respect to the eight improvement objectives, and then the development of a strategy. This report is a step along the way to the development of a full assessment and strategy. The schedule for carrying out this assessment and strategy is:

Completion of Assessment Outline	15 July 1991
Completion of Internal Review Draft Assessment	30 September 1991
OCRM review draft assessment completed	15 October 1991
Completion of Public Review Draft Assessment	31 October 1991
Public review of draft assessment through	15 December 1991
Completion of Final Assessment and Strategy Outline	17 January 1992
Completion of Draft Strategy	14 February 1992
OCRM review of draft strategy completed	28 February 1992
Completion of Final Strategy	20 March 1992

For a better understanding of the intricacies of “Section 309” the reader should obtain a copy of OCRM’s *Coastal Zone Enhancement Grants Program: Guidance on Assessments and Strategies* which is available from Washington’s Shorelands and Coastal Zone Management Program. A pull out mail order form is available at the back of this report.

This assessment and strategy report is prepared according to OCRM’s instructions for format, content, and level-of-detail. OCRM has stipulated that the assessments not exceed 3 to 10 pages each, depending on the relative importance of the improvement objectives. Because of the

difficulty of addressing any complex issue so briefly, where ever possible this report adopts the convention of summarizing and incorporating by reference assessments already completed for other purposes. This version of the Assessment and Strategy report incorporates preliminary comments by OCRM and some state resource management agencies, plus comments received in focus groups and in returned questionnaires (see Public Involvement section).

Washington's Coastal Zone Management Program (CZMP) is often thought to be synonymous with the state Shoreline Management Act (SMA). While the SMA forms the core of Washington's coastal zone program, the CZMP applies only to the fifteen coastal counties: Whatcom, Skagit, San Juan, Snohomish, Island, King, Kitsap, Pierce, Thurston, Mason, Jefferson, Clallam, Grays Harbor, Pacific, and Wahkiakum. Washington's CZMP consists, in addition to the SMA, of elements of the State Environmental Policy Act (SEPA), the Environmental Coordination Procedures Act (ECPA), and other elements.

2 • Public Involvement

Public involvement in the assessment and strategy process began with an announcement in the May, 1991 issue of *Coastal Currents*, Shorelands' monthly newsletter. Individuals or groups were invited to identify which of the eight improvement goals they considered to be most important and why. The questions were also asked: for each priority what should be done that's not being done not? Do we need new or revised laws or regulations, or are non-regulatory approaches preferable? Responses were received from two state agencies, and their initial comments were incorporated into Version 2.0 of this report. No public responses were received.

The November 1991 issue of *Coastal Currents* was devoted to a summary of the Draft Assessment, and included a formal public notice of the beginning of the public review period for this Draft Assessment. The 30-day public review period ended on December 15th, but comments were accepted through December 31. The November 1991 issue of *Coastal Currents* also included a questionnaire on Washington coastal issues. Nearly 200 persons (out of a circulation of approximately 4,000) returned a questionnaire. The preliminary results of the questionnaire returns are summarized in Appendix A to this Assessment and Strategy.

Additionally, four focus groups were conducted in early December in Mount Vernon, Seattle, South Bend, and Olympia. The results of the focus groups are summarized in Appendix B to this report.

In general, comments of a factual nature on the assessment were integrated into the assessment beginning with Version 4.0. Integration means that the information was used to modify existing material or append additional information. Exact quotes of comments were rarely used.

Comments on improvement object priorities or recommendations for specific strategies were used by Shorelands in the selection of improvement object priorities and the development of specific strategies.

3 • Improvement Objectives

This section provides an overview of the typical organization of each of the following improvement objective chapters.

Each chapter begins with a quotation of the full title of the improvement objective as established by Congress and stated in the 1990 amendments to the Coastal Zone Management Act.

The author(s) of the chapter are identified

Assessment

Each assessment section begins with a quotation of the federal guidelines for the content of, and approach to, the assessment. For a copy of these guidelines, please return the mail order form found at the back of this report, and request Guidance on Assessments and Strategies.

The organization of the assessment text for each improvement objective varies, but always concludes with a section titled “Conclusions and Needed Improvements.”

Strategies

For the most part, the Strategies sections in this chapter identify only existing planning documents or procedures which might be adopted.

Please refer to Chapter 4, Strategies for the final strategies

Wetlands

1) Protection, restoration, or enhancement of the existing coastal wetlands base, or creation of new coastal wetlands.

Brian Lynn and Douglas Canning

Assessment

Characterize the status of coastal wetlands, their extent (by type. e.g. tidal and nontidal), trends (rate of gain/loss), and threats (Direct and indirect) to those wetlands.

This assessment is based on prior assessments conducted and developed for the Governor's Executive Order on Wetlands (La Tourrette, 1988), the Washington Environment 2010 study (*Washington's wetlands at risk: Loss and degradation* (Canning, 1990) and *Wetlands of Washington: A resource characterization* (Canning & Stevens, 1990)), and the US Fish and Wildlife Service's trends report (Peters, 1990), which are incorporated by reference into this assessment.

It is important to note that statistical data on Washington's wetlands are limited. Wetlands data specific to individual coastal counties are unavailable at this time. It is assumed that the information about status, trends, and threats that is presented in the following state-wide summary applies for the coastal counties as well.

Coastal Wetlands Characteristics and Extent

Washington boasts a tremendous diversity of wetlands—alpine meadows in the high Cascades; salt marshes along the Pacific coast; river mouth estuaries within Puget Sound; vernal pools and green riparian corridors in eastern Washington; floating sphagnum bogs in pothole lakes; and large areas of freshwater marsh in the Columbia Basin. The botanical characteristics of Washington's coastal wetlands are summarized in *Wetlands of Washington: A resource characterization* (Canning & Stevens, 1990).

Current acreage of wetlands in the State of Washington are summarized in Table 1. Wetlands total 938,000 acres. Separate quantitative information about total coastal wetland acreage (other than the total for estuarine and marine wetlands) is not available.

Status of Coastal Wetlands

Washington is a state with a rapidly growing population and a finite wetland resource. Estimates of pre-settlement wetland acreage vary widely depending on what historical information and research assumptions are used. Estimates of total wetlands loss vary from 33 to 50 percent, with higher losses in localized areas. For example, 70 percent of the tidally influenced emergent wetlands in Puget Sound have been lost (Bortleson, Chrzastowski & Helgerson, 1980).

Besides outright wetland loss, wetland and riparian systems in the state have been so degraded that it is difficult to piece together what these systems looked like prior to European settlement. All wetland sites have been adversely impacted to some degree by upslope or upstream activities. Virtually all sites inventoried in Washington have been disturbed to varying degrees by human or livestock activities. The best sites are recovering from these impacts and are no longer in a pristine state.

Table 1. Washington Wetland Acreage, 1990

<i>Wetland Type</i>	<i>Acres</i>
Estuarine	221,900
Marine	26,600
Palustrine	737,400
Palustrine (linear)	2,100
<i>Subtotal</i>	<i>988,000</i>
(Correction for Oregon wetlands included in Washington Quadrangle maps)	-50,000
<i>Total</i>	<i>938,000</i>

Trends

Several estimates of the current wetland loss rate have been attempted in recent years. All differ from each other, but review of them offers some general understanding of the status of Washington's wetlands. It should be noted that all projections of loss are conservative estimates; whatever numbers are given, significant loss of Washington's wetland base is evident.

According to the US Fish and Wildlife Service discussion paper on *Wetlands and Deepwater Habitats in the state of Washington* (July, 1989), all wetlands and deepwater habitats comprised about 5.5 percent of the state of Washington in the early 1980s. Wetlands made up about 2 percent and deepwater habitats about 3.5 percent of the state. Within the state of Washington only about 67 percent of the estimated wetland acres at pre-settlement remained in the early 1980s. Deepwater habitats decreased by only about 4 percent. These estimates of loss are very conservative; actual wetland losses are expected to be higher than these estimates. In addition, losses do not account for conversion from forested riparian types to deepwater habitat for reservoir construction; they also do not account for degradation. In summary, Washington has lost at least 33 percent of the state's wetlands, and as much as 50 percent.

Other loss projections for Washington include the following losses for freshwater wetlands in the following selected areas of western Washington (Boule, et al., 1983):

Tenino and Yelm quadrangles (south Thurston County): 55%

Tacoma South quadrangle (Pierce County): 82%

Lake Washington area (King County): 70%

A detailed analysis by the US Geological Survey of historical wetland acreage of eleven estuaries in Puget Sound estimates that 100 percent of the Puyallup River, 99 percent of the Duwamish River, and 96 percent of the Samish River wetlands have been lost (Bortleson, Chrzastowski & Helgerson, 1980). In the remaining nine estuaries studied, acreage losses ranged between +0.2% to -89.7%. (See Table 2.)

Table 2. Estimated historical changes in natural habitat of principal estuaries of Washington State.

	Estimated (km ²) sub-aerial wetland		
	Historical	Present	% change
Nooksack	4.5	4.6	+0.2
Lummi	5.8	0.3	-89.7
Samish	11.0	0.4	-96.4
Skagit	29.0	12.0	-58.6
Stillaguamish	10.0	3.6	-64.0
Snohomish	39.0	10.0	-74.4
Duwamish	2.6	0.1	-99.2
Puyallup	10.0	0	-100.0
Nisqually	5.7	4.1	-28.1
Skokomish	2.1	1.4	-33.3
Dungeness	0.5	0.5	0

Source: Bottlenose et al., 1980.

Some local indicators of recent trends are available in Washington. Based on field inventory observations, the Snohomish County Planning Department estimates the loss of 15 wetland acres per month, or 180 acres per year. Based on this figure, statewide losses for the eight counties with similar growth projections plus King and Pierce counties would be 1,800 acres per year for urbanizing counties.

A Department of Ecology study of environmental impact statements (EISs) for rural and suburban wetland losses throughout Washington found that a conservative estimate of wetlands loss is 530 acres per year (Hull & MacIvor, 1987). This study found that well over twice the number of acres of wetland were drained as were filled. This is a concern because the Clean Water Act Section 404 permitting process covers filling but not draining of wetlands. Over 74 percent of the wetlands observed as impacted on the project sites were between one-half and five acres in size; of the wetlands extending off-site, 46 percent were found to be under five acres in size. Small, isolated wetland fills are also not covered under the Section 404 permitting process.

A review of the annual loss of wetlands through issuance of permits under Section 404 of the Clean Water Act indicates 185 acres are lost per year in Washington. This estimate is extremely conservative and does not reflect the acreage losses of isolated wetlands issued under Nationwide Permit Number 26 of Section 404 of the Clean Water Act, nor do they reflect losses from activities other than placement of fill in wetlands.

With increasing populations and a decreasing developable land base, wetland losses are continuing and are expected to increase in the absence of adequate regulatory and

preservation/acquisition programs. This will result in continued loss of wetland functions and values (Table 3).

Table 3. Benefits Derived from Washington’s Wetlands

- Groundwater recharge and discharge.
- Flood storage and desynchronization.
- Shoreline anchoring and dissipation of erosion forces.
- Sediment trapping.
- Nutrient retention and removal.
- Food chain support.
- Habitat for fisheries.
- Habitat for wildlife.
- Active recreation.
- Passive recreation, aesthetics, and heritage value.
- Native plant reserves.
- Biological diversity.

Threats

There are a number of direct and indirect threats to Washington’s coastal wetlands, resulting from either human activity or natural conditions.

Human Threats

Direct Threats

1. Drainage for crop production, timber production, and mosquito control.
2. Dredging and stream channelization for navigation channels, flood protection, coastal housing developments, and reservoir maintenance.
3. Filling for dredged spoil and other solid waste disposal, road and highway construction, and commercial, residential, and industrial development.
4. Construction of dikes, dams, levees, and sea walls for agriculture, hydroelectric energy, flood control, water supply, irrigation, and storm protection.
5. Discharges of materials (e.g. pesticides, herbicides, other pollutants, nutrients from domestic sewage and agricultural runoff, and sediments from dredging and filling, logging, and agriculture, and bacteria from septic and other sources).
6. Mining of wetland soils for peat, coal, sand, gravel, phosphate, and other materials.

7. Vegetation removal, particularly through forestry and other land clearing activities.

Indirect Threats

1. Sediment production from erosion through road construction, land clearing activities through agriculture, forestry and urbanization, and bank destabilization.
2. Introduction of exotic plant species, reduced wildlife habitat values, and reduced species diversity and food chain support from disturbance adjacent to and within wetlands.
3. Hydrologic impacts due to extraction of ground water, oil, gas, sulfur, and other minerals.
4. Stormwater impacts from increased peak flows; and pollutants, sediment and nutrients accumulating in wetland areas.
5. Reduced groundwater exchange capacity from filling springs, and reducing points of groundwater discharge and recharge.
6. Subsidence, including natural rise of sea level.
7. Soil compaction, erosion, and bank destabilization from livestock grazing.

Natural Threats

1. Flooding, particularly rain or snow events, hurricanes and other storms.
2. Droughts.
3. Fire.
4. Ice scour.
5. Erosion.
6. Biotic effects, e.g. muskrat, nutria, and goose “eat outs.”
7. Sea level rise

Existing Response Programs

No single, comprehensive wetlands management program exists for Washington state. The existing program is a composite of regulatory authorities available under the state Shoreline Management Act through local government Shoreline Master Programs; the state and federal Water Pollution Acts through Section 401 certification and water quality permits; the State Environmental Policy Act (SEPA) through review of environmental impact statements; the Puget Sound Water Quality Management Plan; and executive branch endorsement of these authorities through Governors Executive Orders. In the near future, Growth Management Act requirements for special consideration of critical areas (including wetlands) may provide additional protection.

Existing regulations leave major gaps in either wetlands regulated or activities regulated. Existing inventories in the state are also incomplete. Although National Wetland Inventory (NWI) data is complete for the state, local governments require more detailed field inventories at a scale appropriate for permit and project review.

Attempts were made to secure passage of a comprehensive Wetlands Management Act in the 1990 and 1989 legislatures. The legislation was not adopted.

In December 1989 Governor Booth Gardner issued Executive Order 89-10, Protection of Wetlands, which stated (in part) that

Section 1. It is the interim goal of my administration to achieve no overall net loss in acreage and function of Washington's remaining wetlands base. It is further the long-term goal to increase the quantity and quality of Washington's wetlands resource base.

Section 2. In the interest of preserving and protecting valuable resources, the Department of Ecology shall provide guidance and each affected state agency shall provide to the Governor an action plan, where appropriate, to lessen the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Ecology developed a model wetlands ordinance for local government adoption in September 1990. As of January 1992, five cities had adopted the ordinance and six others had it under consideration. (In December 1991 a consortium of agricultural and business organizations filed suit challenging the legality of the model ordinance.) Three cities and one county had adopted some other form of a wetlands ordinance, and five cities and five counties had some other form of a wetlands ordinance under consideration.

Conclusions and Needed Improvements

- Washington State needs a comprehensive wetlands protection program, including regulatory and non-regulatory components, to achieve the no-net-loss goal.
- Assessing wetlands status and documenting change are necessary components of an effort to achieve no-net-loss. To accomplish this end, comprehensive inventory and the establishment of a Geographic Information System are needed.
- As necessary, conduct a sample monitoring pilot for assessing no-net-loss of wetlands in a representative coastal jurisdiction.

Strategies

Ecology would carry out a comprehensive assessment program regarding the linkages between wetlands inventory and characterization, and the ultimate goal of achieving no net loss.

Coastal Hazard Areas

2) Preventing or significantly reducing threats to life and destruction of property by eliminating development and redevelopment in high-hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise and Great Lakes level rise.

Douglas J. Canning, Hugh Shipman, and Tim D'Acci

Assessment

Characterize the extent to which the coastal zone is at risk from the following coastal hazards: hurricanes, flooding, storm surge, episodic and chronic erosion, sea level rise, subsidence, earthquakes, tsunamis, and any other significant coastal hazard.

This assessment focuses on three fundamental issues: flood hazards, geologic hazards, and sea level rise. Though related to varying degrees, the causes of the hazards are fundamentally different as are the existing institutional arrangements for dealing with the problems. Therefore, this section is subdivided into three separate discussions.

The flood hazard assessment is directed at short term events including ordinary flood events, plus special risks due to storm surge, tsunamis, and the combined effect of river flooding with high tides. This assessment builds upon Washington's recent experience with the Comprehensive Flood Control Management Planning process and legislative proposals resulting from severe flooding during the winter of 1990-91. Permanent inundation due to sea level rise is addressed separately.

Geologic hazards include coastal erosion and bluff landsliding, plus threats related to seismic events. The assessment builds upon an ongoing program to assess the effects bulkheading, Washington's Public Trust Doctrine study, and the potential role of the Coastal Barrier Resources Act. Threats related to earthquakes (seismic risk) are poorly understood in Washington state, but appear to present a serious risk to both the Pacific Ocean coast and Puget Sound shorelines. Rapid subsidence, liquefaction of beach and delta sediments, tsunamis, and slope failure may all be expected with a major seismic event in the Northwest.

The sea level rise component addresses existing sea level rise and accelerated sea level rise. This task builds upon our 1988-89 interagency task force, technical and policy studies completed in 1990, and ongoing cooperative studies with local governments and the US Environmental Protection Agency.

Flood Hazards

Nature of the Threats and Areas at Risk

No comprehensive flood hazard assessment has been completed for Washington state. The following assessment is based on the available literature and the professional experience of the authors.

Tidal Flooding Tidal flooding affects specific low-lying areas along the Pacific coast and Puget Sound; it is not a wide spread problem. A combination of high tides and riverine flood crests has also caused problems for specific low lying areas. The coastal cities most at risk are Raymond

and South Bend on Willapa Bay; Aberdeen and Hoquiam on Grays Harbor; and Olympia on Puget Sound. Additionally there are a number of smaller, low-lying communities along the outer and inner coast which are at risk.

Storm Surge Storm surge or coastal high hazard areas (velocity or V-zones) have been identified and mapped along the Pacific coast and for certain areas within Puget Sound. The threat is typically associated with large winter storms involving high winds and/or low pressure cells. The Federal Emergency Management Agency (FEMA) has mapped extensive V-zones in Pacific, Grays Harbor, Jefferson, Clallam, Island, San Juan, Whatcom, Skagit, Kitsap, Snohomish, King, Pierce, and Thurston counties.

River Flooding Riverine flooding associated with high tides is a major threat for certain coastal communities both along the outer coast and within Puget Sound. Areas particularly at risk include the Chehalis, North, Hoh, Skagit, Nooksack, Snohomish, Stillaguamish, and Skokomish rivers, and numerous small drainages leading to salt water. River flooding is often considered to be associated with large scale clear cut logging in the upper portions of the contributing water shed, but this assertion is controversial with the timber industry.

Seismically Induced Flooding The threat is differentiated between tsunamis propagated around the Pacific Rim (Alaska, Chile and Japan) and the potential for a major (R8+/-) earthquake originating in the subduction zone which lies approximately 150 miles off the Washington coast. Areas along the outer coast (Pacific, Grays Harbor, Jefferson and Clallam counties) and in parts of Grays Harbor and Willapa Bay are subject to tsunami impacts.

Damage Assessments

No damage assessment studies have been compiled which are specific to coastal flooding.

Existing Response Programs

At the state level, two programs address flood hazard management: the Floodplain Management Act (Chapter 86.16 RCW) and the Flood Control Assistance Account Program (FCAAP: Chapter 86.26 RCW).

Floodplain Management Act The state's primary floodplain management activity involves the regulation of development within flood hazard areas by localities pursuant to the National Flood Insurance Program (NFIP) and the Floodplain Management Act which adopts the federal minimum standards as the state standards. State law also prohibits the construction or reconstruction of residences in any designated floodway. Approximately 250 communities participate in the NFIP.

Flood Control Assistance Account Program The Flood Control Assistance Account Program (FCAAP) was established by the state Legislature in 1984 to assist local jurisdictions in comprehensive planning and maintenance efforts to reduce flood damages. The Department of Ecology may participate through matching grants with counties, cities, towns, and other special districts which have responsibilities for flood control.

In order to be eligible for FCAAP assistance the flood plain management activities of a local jurisdiction must be approved by the Department of Ecology. Local jurisdictions must participate in the National Flood Insurance Program (NFIP) and meet all of its requirements, and must restrict land use in the floodway of rivers to only flood-compatible uses.

To provide for grants and for program administration statewide, four million dollars is placed in the Flood Control Assistance Account by the state Treasurer at the beginning of each fiscal biennium (July 1 of odd-numbered years). Up to \$500,000 in non-emergency grant funds is available during the biennium for all jurisdictions within any one county. Any allocated funds which are not spent during a biennium are lost and may not be carried over to the next biennium. Eligible work continuing over into a new biennium can only be funded from appropriations made from the new biennium.

Matching grants are available on a reimbursable basis for three different activities: Comprehensive Flood Control Management Plans (CFCMP), Flood Control Maintenance Projects, and Emergency Flood Control Maintenance Projects.

Comprehensive Flood Control Management Plan grants up to 75% are available to assist local jurisdictions in preparing a comprehensive plan for an appropriate planning area. A plan must include a determination of the need for flood control work, a thorough assessment of alternatives, a thorough analysis of environmental impacts and impacts to resources, an evaluation of problems and proposed solutions, and prioritized recommendations. In order to remain eligible for FCAAP grants for maintenance work the final CFCMP must be adopted by the local jurisdiction after it has been approved by the Department of Ecology in consultation with the departments of Fisheries and Wildlife. In addition the Department of Community Development must certify that an acceptable local emergency management plan is being administered.

Conclusions and Needed Improvements

Additional state standards may be necessary to reduce flood damages, particularly with regard to new development. Additional standards concerning performance standards for floodplain development, e.g. requiring an additional foot of freeboard for structures built in floodplains; siting standards which would prohibit critical facilities from being constructed in floodplains (e.g. schools, hospitals, nursing homes, and police, fire and emergency response facilities); and additional standards which address development subject to river channel changes, moveable streambeds, and erosion in a stream's meander belt should be considered for adoption.

The existing regulatory authorities governing development in flood hazard areas are based upon the minimum national standards of the National Flood Insurance Program. While some communities have exceeded the minimum standards, a point of weakness is the reliance on construction standards using the base flood elevation. As discussed above and in the evaluation section, an additional state standard requiring at least one foot of freeboard above the base flood elevation would be prudent. This would require action by the State Legislature (for a state-wide mandate), as would adoption of the other additional standards enumerated in the Evaluation Section. Local governments are, of course, now restricted from taking such action.

The area of dune management as it relates to development in coastal high hazard areas is another area needing attention. As development increases along the outer coast, property owners are manipulating sand dunes to improve views. Some owners have scalped accreting dunes and others have removed vegetation which has blocked their views of the water. Such management is not directly addressed in most local flood damage prevention ordinances.

Geologic Hazards

Three geologic hazards are evaluated—erosion, landsliding, and seismic events—each with respect to the nature of the threat, the areas at risk, and existing response programs.

Shoreline Erosion

No comprehensive assessment has been completed for Washington state, although information is available to varying degrees of accuracy and completeness in the *Coastal Zone Atlas* which is incorporated by reference into this report. The following assessment is based on the available literature and the professional experience of the authors.

Nature of threat The rate of erosion along Washington's shoreline is highly variable. In some areas erosion is simply not a problem, whereas in some places erosion is rapid. Erosion is rarely catastrophic and life-threatening, but can result in large losses of property.

Erosion is related to the geology of the shoreline, the wave energy of the location, the supply of sediment to the area from along the shore, and to human modifications of the shore. Erosion in Washington falls into two basic categories: beach erosion and bluff retreat. The former is often the result of a loss of sediment supply, whereas the other may be largely related to the local geology.

Another fundamental factor in controlling erosion patterns is changes in relative sea level. In Washington, the accretion of the ocean beaches and the erosion in Puget Sound are related in part to sea level change (Phipps, 1990; Shipman, 1990); see also the following section on sea level rise.

Areas at Risk The southwestern coast of Washington consists of wide sand spits and large protected estuaries. The beaches of Grays Harbor and Pacific Counties have accreted (built oceanward) throughout the last several thousand years. This pattern has continued in recent times (Phipps, 1990; Phipps and Smith, 1978). Localized erosion has occurred at the entrance of Willapa Bay (Terich and Levenseller, 1986) and at Westport near the south jetty of Grays Harbor. Erosion is also rapid along exposed shorelines in Willapa Bay.

The Olympic Coast is remote and largely undeveloped and little is known of erosion rates. Rau (1973) estimated an erosion rate of 3 feet per year at one location, but this may not be representative.

The shorelines of Puget Sound consist of glacial materials that are particularly vulnerable to erosion. Keuler (1988) mapped erosion patterns along various types of shoreline in Puget Sound and measured erosion rates of about 5 to 30 centimeters/year. The Coastal Zone Atlas (Ecology, 1978) included a qualitative estimate of erosion along the entire Puget Sound shoreline and found over 30% to be actively eroding. A much larger portion may be subject to more gradual or episodic erosion.

Existing Response Programs Rates of shoreline retreat are slow enough in much of Washington that little attention is paid to locating structures away from the shore. The general response to erosion in Puget Sound is the armoring of the shoreline, either with riprap or with concrete bulkheads and seawalls. As of the mid-1970s roughly 8% of the Puget Sound shoreline was armored (Downing, 1983), largely in urban areas, but this number has certainly increased in the last 15 years. The greatest increases have occurred along residential shorelines.

Concern has grown in the state about the cumulative impacts of bulkheading on both the physical and biologic function of the shoreline (see also the Cumulative and Secondary Effects of Growth section of this report). The Shorelands and Coastal Zone Management Program has an ongoing program in this area to address the effects of shoreline hardening (Terich & Schwartz, 1990) and alternatives to shoreline hardening (Terich, Schwartz & Johannessen, 1991a, 1991b). A project to evaluate the rate and character of shoreline hardening in Thurston County was scheduled to be completed by June 1992, but had to be cancelled for a lack of funding.

The level of concern is such that the commissioners of Thurston and Mason counties and the Pierce County Executive have requested the Washington Department of Ecology to prepare a programmatic environmental impact statement on the cumulative effects of bulkheading. There is also growing interest on the part of shoreline property owners in alternatives to bulkheading: sloped rock revetments, beach feeding, and vegetative methods of shore protection. The adverse effects of large scale shoreline hardening are discussed in the Cumulative and Secondary Effects of Growth section.

The construction of erosion protection structures is regulated under local Shoreline Master Programs (established and approved under the state Shoreline Management Act), by local construction codes, and by the Department of Fisheries Hydraulics Permit. However, the Shoreline Management Act exempts single-family residences from the regular permit process for shoreline developments. Because such a large percentage of the shoreline is zoned for single-family residential use, the proliferation of hardened shoreline will likely continue without better documentation of the consequences or better information about alternatives. In the near future, Growth Management Act requirements for special consideration of critical areas (including erosion prone areas) may provide additional protection.

There are growing concerns that the historic accretion of the southwest beaches may not continue—due to the trapping of sediment by dams on the Columbia River and the possible acceleration in sea level rise postulated with global warming (Phipps, 1989).

The most critical step in better managing erosion problems in the state is information and documentation about the rate and processes of shoreline retreat. There is also a need for more information on the effectiveness and on the environmental impacts of shoreline hardening.

As information is compiled the state can provide guidelines and information to help local jurisdictions amend Shoreline Master Programs. Local government will need to address the use of progressive setback rules and standards for erosion protection structures.

Landsliding

No comprehensive assessment has been completed for Washington state, although limited information has been compiled in the *Coastal Zone Atlas* and several separate Department of Natural Resources reports. The following assessment is based on the available literature and the professional experience of the authors.

Nature of Threat Landsliding presents a number of risks to coastal areas. Development along bluffs may be at risk from sliding or settling and the development at the base of bluffs may be threatened by burial. Landslides into coastal waters can also result in large waves that may flood adjacent low-lying communities.

Coastal landsliding in Washington may occur as large rotational slumps which may move only inches a year, or as rapid earth and mud flows. The details of coastal landsliding have been explained in Thorsen (1987). The most important factors are the local geology and the hydrologic conditions.

Areas at Risk Landsliding can occur along the edges of the large estuaries of southwest Washington and along the bluffs north of Grays Harbor, but a bulk of Washington's landsliding problems are located around the Puget Lowland. Over 30% of Puget Sound's shoreline is mapped as unstable, and in some counties the percentage is much higher (Downing, 1983). These unstable areas include many old landslides, as well as many potential slides. Many of these old landslides have already been built on, either out of ignorance or overconfidence.

The glacial stratigraphy of the Puget Sound region, typically interbedded sand and gravel, and clay layers, is a major contributor to the instability of shoreline bluffs. Where the geology can be mapped, the likelihood of landsliding can often be predicted. Landsliding can also be favored by improper clearing and grading practices and by poor drainage in upland areas.

Landsliding risk is greatest for development along the edge of unstable bluffs, or at the base of these bluffs. Development on existing landslide deposits is clearly hazardous. Low lying sand spits and beaches are also vulnerable to waves caused by nearby landslides or submarine landslides.

Existing Response Programs Regrading or improving drainage on unstable slopes may minimize the risk from landsliding, but often these measures are not taken until after a problem has occurred. Another solution often used in the Puget Sound region is the construction of a bulkhead to reduce wave undercutting and to retain the bank, but these efforts are often insufficient, and bring with them the problems associated with shoreline hardening discussed in the erosion section. In the near future, Growth Management Act requirements for special consideration of critical areas (including landslide prone areas) may provide additional protection.

Some counties have instituted standards for building on marine bluffs, though often these rules do not in themselves prevent future landslide problems. No state policy has been developed, but technical guidance has been developed which recommends setbacks and geotechnical review (Canning, 1991). The best solutions typically involve identification of hazardous slope areas, liberal setback requirements, and the maintenance of natural, vegetated buffers.

As with erosion, the first step is identification of unstable areas, and the establishing of criteria for building on or near those sites. The managing of both surface and ground water is important to maintain slope stability. Guidelines can be developed that address clearing and grading processes, surface water management, and altering of natural vegetation. Guidelines can also address appropriate setbacks for marine bluff construction.

From a shoreline management perspective, it must be recognized that most engineering solutions to landsliding also involve shutting off the natural flow of material to the beach. This can only aggravate erosion problems elsewhere and lead to negative environmental impacts.

Seismic Hazards

No comprehensive assessment has been completed for Washington state. The following assessment is based on the available literature and the professional experience of the authors.

Nature of the Threat Earthquake hazards in Washington State have been summarized by Noson et al (1988). Hazards of particular consequence to coastal areas include ground failure, landsliding, subsidence and inundation, and tsunamis. Ground shaking can lead to settling or liquefaction of unconsolidated sediments, such as those found around estuaries or sand spits. Coastal landslides may also be triggered by earthquakes. Vertical displacements of the land surface can result in permanent inundation if they occur on land, or major tsunamis if they occur on the sea floor.

Areas at Risk Washington lies on the Cascadia subduction zone and is an active tectonic region. The nature of the earthquake threat is different on the outer coast than in the Puget Trough, as are the possible hazards.

Recent studies indicate that large subduction zone earthquakes very likely have occurred off the coast of Washington and Oregon, but that none has occurred in recorded history and the recurrence interval may approach 500 years. Such thrust earthquakes might have magnitudes greater than 8.0. The evidence suggests that they are accompanied by tsunamis and large scale subsidence. This is typical of similar earthquakes along other subduction zones such as Alaska or Chile.

The tsunami threat along the outer coast is significant, both along the sandy exposed coast and at the mouths of the estuaries and rivers. The tsunami threat on the sandy shoreline is greatest where the primary dune has been lowered for beach access or to maintain views (Thorsen, 1988). Tsunamis could lead to inundation and severe structural damage in developed areas around Grays Harbor.

The Puget Sound region is vulnerable to ground shaking from the subduction zone earthquakes, and is also at risk from more localized earthquakes (Noson et al, 1988). The earthquakes of 1949 (Olympia, magnitude 7.1) and of 1965 (Seattle, magnitude 6.5) did considerable damage.

The risks to shorelines in the Puget Sound region include localized tsunamis, ground failure and liquefaction of low-lying coastal areas (accreted landforms and river deltas), coastal landsliding, and permanent inundation due to subsidence. Localized tsunamis would result from massive coastal or submarine landslides; the magnitude of the tsunami would probably not so great as a coastal tsunami.

Existing Response Programs Studies of earthquake risk have been carried out by the USGS, the state's Department of Natural Resources, and by several academic institutions. Funding has been limited and the level of knowledge is low. The state's Division of Emergency Management works with local governments to develop response plans for natural disasters. In the near future, Growth Management Act requirements for special consideration of critical areas (including seismic risk areas) may provide additional protection.

Response to seismic threats generally takes the form of structural standards for construction projects and emergency plans. Another approach is to identify areas of seismic risk and the state's new Growth Management Act includes provisions for mapping such areas. This would presumably lead to restrictions or standards for building in these areas.

The earthquake threat is still poorly understood in Washington and considerable additional research is necessary to identify the frequency and magnitude with which they may occur. Areas at risk from earthquakes can be identified in the absence of such information, but unless a risk can be clearly stated, the possibility of implementing policies is difficult.

The most susceptible areas are low-lying shorelines consisting of sands and muds, where the combined threats of tsunamis, subsidence, and ground failure are present. Other locations of critical importance are coastal bridges and large structures, evacuation routes, and hazardous waste sites.

Guidelines can be established that require construction in vulnerable areas to meet strict standards and that prevent placement of critical public facilities in such areas. On the ocean beaches protection of the primary dune is crucial.

Conclusions and Needed Improvements

The rates of shoreline retreat in Washington state are not so dramatic as on the Atlantic and Gulf coasts where retreat rates are often measured in feet per year rather than the tenths of a foot per year common in Puget Sound. None the less, shoreline retreat is perceived to be a significant problem by many persons. The adverse effects of shoreline hardening upon intertidal habitats and resources for erosion management is also perceived to be a problem by a different set of persons. Shoreline landsliding is often mistaken for a purely shoreline erosion caused problem; in fact, shoreline erosion is merely a factor in a problem due more to unstable slopes. Shoreline erosion and bluff landsliding, in and of themselves are not a problem. The problem lies more in the fact that property owners are placing structures hazardously close to the tops of bluffs or the edges of eroding shorelines.

- A more thorough understanding of the cumulative effects of shoreline hardening is necessary (as requested by the Thurston County and Mason County commissioners).
- Model Shoreline Master Program elements for [1] bluff setbacks, [2] bluff stabilization, and [3] shoreline erosion management could be prepared by Shorelands for consideration and adoption by local governments.

Sea Level Rise

This section is based on two previously completed assessments which are incorporated by reference into this document: *Vertical land movements in coastal Washington: Implications for relative sea level change* (Shipman, 1989), and *Sea level rise in Washington state: State-of-the-knowledge, impacts, and potential policy issues* (Canning, 1990).

Nature and Degree of Threat

The nature and degree of the threat from sea level rise is differentiated between near term existing sea level rise and the potential for long term accelerated sea level rise.

Existing Sea Level Rise Rate In the near term, the threat is moderate and is caused by the existing rate of sea level rise (12 cm/century) as mitigated or aggravated by regional vertical land movements. Along the Pacific Ocean coast, uplift exceeds the existing rate of sea level rise in the vicinity of Neah Bay and the Columbia River estuary, producing a net relative sea level fall. Within Puget Sound vertical land movement ranges from zero in the San Juan Islands-Skagit Bay-Sequim area, to 24 cm/century at Tacoma. The maximum relative sea level rise is 36 cm/century (1.2 feet/century) at Tacoma.

Accelerated Sea Level Rise Currently the generally accepted scenarios for accelerated sea level rise due to global climate change range between 0.5m and 1.5 to 2.0m rise by 2100. Taking vertical land movement in account, a 1.0m acceleration scenario would result in a 0.5m sea level

rise in Tacoma by 2050, in Seattle by 2055, and in Friday Harbor by 2067. Under this scenario, the uplift at Neah Bay would delay occurrence of a 0.5m rise until about 2080.

Nature of Risk

The nature (and degree) of the risk depends, of course, on the rate of sea level rise, as well as local geologic, geographic, and land use and land development characteristics.

Existing Sea Level Rise Presently, existing sea level rise is causing or aggravating shoreline erosion and bluff land sliding. As noted above in the Geologic Hazards section, erosion and erosion management is currently an issue of concern with coastal managers in state resource agencies and local planning departments. Sea level rise and local land subsidence is associated with rising water tables and the conversion of uplands to fresh water marsh and swamp at locations such as the Skokomish River delta.

Accelerated Sea Level Rise Over a period of decades, accelerated sea level rise is expected to aggravate existing erosion and landsliding problems. Sea water intrusion of coastal aquifers, which is presently a problem on the islands of north and central Puget Sound and along Hood Canal due to ground water withdrawals, will be aggravated. Areas presently at risk of flooding will experience more frequent and more severe flooding; areas just above the flood zone now will become subject to flooding. Wetlands and possibly other low lying coastal areas will be subject to inundation. Wetlands will be drowned and converted to intertidal mudflat or subtidal habitat. Developed areas not otherwise protected will convert to a natural habitat.

Areas at Risk

The types of areas at risk are primarily unconsolidated shorelines, low-lying areas, coastal wetlands, accreted shoreforms, intertidal and shallow water habitats, and major river deltas. No quantitative studies have been carried out to delineate the extent or degree of risk.

Unconsolidated shorelines (e.g. sands, gravels, and clays) include most Puget Sound, Grays Harbor, Willapa Bay, and Columbia Estuary shorelines. The rocky shores of the San Juan Islands are a notable exception. Unconsolidated shorelines are susceptible to erosion. The present long term average erosion rates of a few tenths of a foot per year are expected to increase under any sea level rise acceleration scenario.

Low-lying areas will be threatened from storm surge, flooding, or inundation depending on the acceleration scenario, their elevation, and the technical and fiscal feasibility of protection. Urban areas potentially threatened storm surge, flooding, or inundation are typified by the central business district of Olympia, the state's capitol. The City of Olympia is presently carrying out an assessment of the implications of local sea level rise under a Coastal Zone Management grant; the assessment report will be completed by June 1992. Other developed low lying areas have investments in agricultural lands, public highways or air ports, residential real estate, or other facilities at risk.

Coastal wetlands will be threatened by erosion or inundation as described in *Greenhouse effect, sea level rise, and coastal wetlands* (Titus, 1988) which report is incorporated by reference into this document. An assessment of selected Puget Sound shorelines is presently being carried out by Holcomb Research Institute in cooperation with the Washington Department of Ecology under a US Environmental Protection Agency grant; the final project report is scheduled for publication by US EPA in spring 1992.

Accretional shoreforms (coastal barriers, sand spits, etc.) will be threatened by erosion, storm surge, flooding, or inundation. The principal accreted shoreforms are inventoried and characterized in *Coastal barriers and accreted landforms in Washington state: Inventory and characterization* (Shipman, 1991) which report is incorporated by reference into this document.

An unpublished study on sea level rise beach erosion and mitigation carried out for the US Environmental Protection Agency estimated the amount of sand necessary to mitigate erosion on Washington’s Pacific Ocean beaches (Leatherman, n.d.). The estimates are summarized in Table 3.

Table 3. Sand volumes requirements for State of Washington to raise the beach/nearshore profile with sea level rise.

Sea level rise (feet)	Sand required (million yd ³)
1	33.101
2	66.202
3	99.303
4	132.404
5	165.505
6	198.606
7	231.707
8	264.808
9	297.909
10	331.010

Total Pacific Ocean shoreline considered for nourishment is 48.36 miles out of a total of 157 miles

Intertidal and shallow water habitats will be at risk from a likely secondary effect of sea level rise response. As some shorelines become hardened (bulkheads, sea walls, rip rap, etc.) to resist erosion, the shoreline will become fixed in place, and rising sea level will steadily lessen the extent of intertidal and shallow water habitats, possibly eliminating intertidal habitat in some locations. Intertidal and shallow water habitats are important for the rearing and migration of juvenile salmon, spawning of Pacific Herring and Surf Smelt, and the life cycle of certain shellfish.

Major river deltas will be subject to the same threats as low lying areas and accreted shoreforms. Additionally, the delta waters will be subject to salinity changes affecting the general ecology. The major river deltas of greatest concern are the Skagit, Snohomish, Puyallup, and Nisqually on Puget Sound, the Chehalis on Grays Harbor, and the Willapa on Willapa Bay. Other deltas which might be of concern are the Union, Skokomish, Hamma Hamma, Duckabush, Dosewallips, and Quilcene on Hood Canal. River deltas and adjacent valley bottoms will be susceptible to sea water intrusion and a forcing of the water table to higher elevations. This in turn will lead to soil

saturation and tertiary effects of decreased soil drainage and increased duration of flooding, increased corrosion of underground tanks and pipes, the need to drain agricultural lands, and decreased effectiveness of sewage drain fields or possibly the need to install sewerage systems.

Existing Response Programs

The Washington state Shorelands & CZM Program initiated its Sea Level Rise Response Project in 1988. In the near term, the overriding issue will be shoreline property protection. Three inventory tasks, in conjunction with the shoreline hardening studies and the public trust doctrine, represent a package of tasks which collectively are directed towards policy response to the anticipated demand for increased shoreline property protection. The potential conflict between property protection desires and the state's trust responsibility to protect public resources must eventually be addressed at the policy level. In the long term, the issue of retreat or protection of urban areas at risk from inundation and periodic flooding will become more important. Either option will be very expensive, running into the millions to billions of dollars.

The Washington Environment 2010 Action Plan recommends that the Sea Level Rise Task Force be reconstituted as a Washington interagency global climate change coordination committee.

Beginning in the current 1991-92 fiscal year, recipients of Coastal Zone Management Section 306 or 306A grants were required to engineer and construct for the existing rate of sea level rise, and to carry out conceptual planning for accelerated sea level rise as applicable. The City of Olympia is carrying out a specific study of the potential effects of sea level rise on the city and a review of potential response alternatives.

There are presently no regulatory programs for sea level rise.

Conclusions and Needed Improvements

Planning, engineering, and construction for the existing rate of sea level rise is clearly appropriate, and might be instituted into existing permitting programs at all levels of government. Similar provisions for accelerated sea level rise are problematic due to the uncertainty of future sea level rise rates. Conceptual planning for accelerated sea level rise is feasible and might be addressed. Evaluation of the sea level rise threat to specific projects might be carried out through environmental impact statements under the State Environmental Policy Act.

More and better information on the implications of sea level rise for Washington shoreline habitats and land uses is necessary before the political agreement can be mustered for regulatory approaches.

The anticipated reaction to sea level rise within Puget Sound is expected to be large scale shoreline hardening to protect against erosion. The adverse effects of large scale shoreline hardening is already an issue (see Cumulative and Secondary Effects of Growth section). The first steps to establishment of a sea level rise response program include the establishment of improved management practices for shoreline erosion control and the related permitting programs at the state and local government levels.

Strategies

Flood Hazards

Ecology would carry out a comprehensive study of the strengths and weaknesses of the existing array of regulatory programs embodied in the state Floodplain Management Act and Flood Control Assistance Account Program, plus the federal National Flood Insurance Program with the intent of clearly identifying specific improvements and the most appropriate means of integrating those improvements into the existing legal and regulatory framework.

Geologic Hazards

Ecology would carry out a study on the cumulative effects of marine shoreline hardening on the physical and living environment, including assessment of alternative erosion control practices, regulatory systems, and permitting programs. The study may be presented as a traditional study report or as a programmatic environmental impact statement. The study would entail seeking answers to the following questions:

What is the extent, rate, and character of recent shoreline armoring? No hard core data exists, only professional observations and opinions. During FY 1992 it was planned to carrying out an inventory and characterization of Thurston County shoreline armoring, but budget cuts caused the project to be cancelled. The answer to this question will enable a quantitative discussion on the extent and nature of shoreline hardening over the past 15 years.

What are the alternatives to shoreline armoring, and what is their viability and impacts under different energy regimes? The study must address alternatives. In recent years we have addressed this question through the annotated bibliographies prepared by Western Washington University, but the results are indicative, not conclusive. Impacts would be addressed separately; this task would assess the engineering viability, longevity, and relative cost of selected alternatives (bulkheading, rip rap, beach nourishment, no action, etc.).

How can slope failure (landsliding) be best managed? A large measure of bulkheading is in reaction to slope failures, not shoreline erosion *per se*. Slope instability is caused by a combination of inherent geologic weaknesses, ground water loading, and toe erosion. This has been observed in many of the site inspections carried out by Shorelands staff. It is anticipated that a combination of construction setbacks, ground water management, and shoreline erosion management is needed for a balanced approach.

What are the cumulative effects of shoreline armoring on physical coastal processes?

In recent years we have addressed this question through the annotated bibliographies prepared by Western Washington University, but these reports lack a thorough interpretive element. The preparation of a technical report on the direct, secondary, and cumulative effects of shoreline erosion control alternatives (bulkheading, rip rap, beach nourishment, no action) on physical coastal processes is needed.

What are the cumulative effects of shoreline armoring on ecological systems? The answer to this question must follow up on the answer to the previous question. This task should be carried out by a team with credentials in coastal ecology (fisheries, shellfish, etc.) for the preparation of a technical report on the direct, secondary, and cumulative effects of shoreline erosion control alternatives (bulkheading, rip rap, beach nourishment, no action) on intertidal, shallow subtidal, and near shore uplands habitat structure and function, biodiversity, and productivity.

What are the water quality implications of past shoreline armoring when land creation was a secondary effect? In the past onsite sewage disposal drainfields were constructed on shoreline

fill. To what degree are these old facilities having adverse effects on present day water quality, particularly with respect to shellfish?

What are the long term implications of shoreline armoring for public agencies with resource management, emergency response, and maintenance responsibilities in the shoreline? The answer to this question should have fiscal and public trust doctrine implications. That may mean two separate study contracts.

What are the management/regulatory implications of managing shorelines on drift cell basis rather than on a case-by-case basis? In addition to alternatives to structural and nonstructural methods, the study must address alternative management schemes such as evaluation of permit applications in the context of whole littoral cells.

What are the relative strengths and weaknesses of alternative approaches to coastal erosion management? In addition to the “business as usual” alternative, this task would address the differential between protection of existing facilities and proposed facilities, setbacks, relocation, and other alternatives to be identified.

Study program integration. This task will integrate the special study reports into single summary report or programmatic environmental impact statement.

Sea Level Rise

Initial strategies for sea level rise response are identical to those proposed for Geologic Hazards.

Public Access

3) Attaining increased opportunities for public access, taking into account current and future public access needs, to coastal areas of recreational, historical, aesthetic, ecological, or cultural value.

James Scott

Assessment

Characterize the adequacy of existing public access sites, site improvements, and maintenance programs.

This draft assessment builds upon a successful marine shoreline public access program, the results of the 1991 Public Access Conference, and the Washington State Public Trust Doctrine study. This section is based partly on a previously completed assessment marine public access facilities (Scott & Reuling, 1986) which is incorporated by reference into this document.

Coastal Zone Public Access

Public Access is the legal physical ability of the general public to reach and touch the water's edge and/or the ability to have an unobstructed view of the water and the shoreline from upland locations. The public, for much of the shorelines in the 15 coastal counties of Washington state does not have this ability even though significant improvements have been made under the CZM section 306A grant program and through state-funded grant programs.

The problem is a dual issue. First, the provision of shoreline public access has not kept pace with Washington's population growth. Second, and no less important, is the problem of peak demand: reportedly about 90% of the recreational public access demand occurs on only 30 days of the year.

Current Program

Washington's current shoreline public access program is a combination of grant funding for acquisition and development, technical assistance to local government officials, information dissemination including signing of public access sites. A total of eighteen sites have been developed using federal/local 306A Coastal Zone Management grant funds (Table 4).

In addition to acquisition and development, the State of Washington has used CZM funding to sign public access sites, to provide local development permit administrators and parks and recreation people with information on how to do a better job of providing for public shoreline access.

A public access guide, which is sold in book stores, to the states marine shoreline was prepared by the Department and published by the University of Washington Press. In 1990 a public access handbook was published to help people who plan and build public access sites do a better job. And, research has been funded on the applicability of the Public Trust Doctrine in Washington State, to determine if there are stronger legal bases for securing shoreline public access. In spite of these advances however, the total picture for shoreline public access in Washington State is not bright.

Table 4. Completed 306A Projects

1. Skagit County Pedestrian/Bicycle Path
2. La Conner Public Access Float
3. Otter Island Wetland Acquisition (Snohomish County)
4. Seattle Aquarium Access Float & Monitoring Station
5. Woodland Creek Wetland Acquisition (Thurston County)
6. Skookum Inlet Wetland Acquisition
7. Tarboo Bay Wetland Acquisition (Jefferson County)
8. Langley Beach Access Stairs
9. Clallam County Tidelands Acquisition
10. Morrison Creek Footpath & Bridge
11. Westport Whale Interpretive Building & Lecture Hall
12. South Bend Public Access Float
13. Long Beach Dune Boardwalk
14. Anacortes Beach Acquisition
15. Raymond Waterfront Park Dock & Trails
16. Wahkiakum County Footbridge
17. Wahkiakum Port District Beach Acquisition
18. Port Orchard Pedestrian Pier

Legal Analysis

The authority for the department's shoreline access program is specifically founded in the state's Shoreline Management Act of 1971. The Shoreline Act has specific language about improving access to water and in providing increased opportunities for shoreline public recreation. Permits are issued for shoreline development under this program. Many of these permits are conditioned to provide public access.

The Shoreline Act, although establishing a regulatory program under the state's police powers is rooted in public trust doctrine principles. The SMA in particular and the State Aquatic Lands Act (administered by the Department of Natural Resources) embody the public trust doctrine in state law. The SMA was created in response to a state supreme court ruling on filling in navigable waters for non-water dependent (non-public trust) uses. This landmark case both initiated the SMA and set the stage for addition "public trust doctrine" cases.

At this time, after 20 years under the Shoreline Act, the public trust doctrine has been affirmed as a valid doctrine in Washington State. There are some undecided areas about the public trust doctrine especially as to what its full scope is in relation to public use of shorelands.

The Current Situation

The right of public access is obstructed in many locations by private ownership of real property and by topographic limitations. For example, more than 60% of greater Puget Sound tidelands are in private ownership. Of the remaining 40%, the majority is blocked by upland private ownership and a significant amount is physically unsuitable (e.g. rocky headlands, steep bluffs) for public use. The bottom line is that the general public has access to only about 10% of Puget Sound beaches.

The Washington Wildlife and Recreation Coalition stated in its 1989 report, after surveying the entire state:

Loss of public access to water is one of the most pressing outdoor recreation problems facing Washington residents in the near future. In fact, this was the most common single concern expressed to the Coalition during its statewide public meetings.

Washington has approximately 18,000 miles of freshwater shoreline. Of this 42% is in the 15 coastal zone counties.

On rivers, access points for boating and fishing are limited. A number of the accesses that are currently in use are over private property where the landowner has largely ignored the activity. There is evidence of change with increasing confrontations between river users and property owners.

Access to many of our lakes is blocked by privately owned shoreline properties. In a few instances public purchase has obtained limited access to these lakes, but in general public access even to navigable lakes is severely restricted.

Adequacy of Existing Public Access

Marine Shoreline Washington has approximately 2,400 miles of marine shoreline. About 300 miles are on the open ocean; the remainder is inland waters such as Puget Sound. Public Access on the outer coast is not a problem. [Note: this distinguishes public access from public recreation, where access is simply the legal/physical ability of the public to get to the water and recreation means actually having water based and water related opportunities and facilities for them.] Adequacy of support facilities, such as public parks and developed recreation sites is generally considered to be inadequate for the growing population. Outer coast day use and over night public sites are heavily over-used now, and there is little opportunity for future development. The most suitable sites either have already been developed, or because of ownership, are not available.

Public Access to the state's 2,100 mile inland waterway shoreline is severely limited. The best access sites are the various public parks that are located on greater Puget Sound. The capacity of these to accommodate public use is limited and turn-away crowding is common.

While the number of sites on the state's marine shoreline sounds large, about 700, there is only a small portion that provide any significant opportunity for public use and access. This is because the majority of the sites are tidelands accessible by boat only and have no corresponding upland public ownership.

Two major constraints placed on the acquisition of public access are availability of public funding and a dearth of properties available for purchase. The value and scarcity of available

waterfront property is such that when a property is placed on the market it is often snapped up before any public agency can initiate the cumbersome process of public acquisition. Moreover, most shoreline property sales are small lots, which individually do not have sufficient land area for a public recreation site.

A regional public shoreline park site generally require 5 or more acres with the most desirable park sites being 25 acres or larger. (Urban or neighborhood shoreline parks can, of course, be smaller.) A quick examination of ownership maps shows that parcels this large are very rare close to major urban areas where virtually all the shoreline has been divided in small lots for home sites. Another complicating factor is that much of Greater Puget Sound shoreline is high eroding bluff.

Rivers The principal problem with river-based recreation is the lack of access points. Many river systems originate on federal lands (US Forest Service and National Park Service) where access is limited only by topography. However, the most desirable segments of rivers for instream recreation are usually located where access is limited to just a few places. Typical of these access points are public road rights-of-way where roads cross or run parallel to rivers, access at public park sites on the rivers, and access that have been developed by the state Department of Wildlife (primarily intended for fisherpersons).

Subdivision of streamside property for home sites is rapidly occurring in western Washington. As these sites are created and developed more and more restrictions are being placed on the general public who have used these same areas for stream-bank access. Moreover, there does not exist, in the Shoreline Management Act, a means for requiring public easements along stream banks when the development is individually developed single family residences. In the case of subdivision, a stream bank easement may be required by the shoreline permit.

Lakes Most of the larger lakes of Western Washington are legally navigable. This means the general public has a legal right to use their water surface for recreational navigation (pleasure boating, etc.). However, whether or not the public can get on those lakes is a significant question. In addition, the general public does not have the capability to use the shoreline, only the water. Shoreside recreational use is limited to just a few developed sites.

Access to even navigable lakes is typically limited to just a few developed access points. The developed access points on any large lake is relatively close proximity to the state's major population centers are typically used to capacity all summer long.

On the smaller, non-navigable lakes, the general public may have a right of common use with the riparian property owners if the state happens to own a shoreline property affording them access. This is common, because of a program the Department of Wildlife pursued to acquire accesses on lakes.

Carrying Capacity This is an open question, that directly affects how much access is enough is the concept of carrying capacity. Carrying capacity has two elements. One is the idea of the physical capacity of a site (or water body) to accommodate use without unacceptable site damage due to overuse. The other idea is that of social carrying capacity, where individual recreation experiences are affected by conditions of overcrowding. This latter condition is very elusive and as people become more and more accustomed to overcrowding, their tolerance for accepting overcrowding seems to raise.

In both cases, any amount of use means that environmental and social impacts will occur. Its a matter of determining what an acceptable level of change is and working not to exceed that capacity.

Water Trails A water trail is a trail that provides a route or path to, on, or along a body of water (RCW 67.32.080, Washington State Recreation Trails System). Currently there is no managed water trail on fresh or salt water in the State of Washington even though the Lewis and Clark National Historic Trail follows the Snake and Columbia rivers. There are undoubtedly several opportunities to create water trails, such as the Nisqually River, the Skagit River, Lakes Washington, Sammamish and Union together with the Ship Canal and Sammamish River. There is also a user group advocating a marine water trail extending from Olympia (southern end of Puget Sound) to Canada.

Water trails have two requirements. There must be shoreline access sites that provide basic support opportunities, such as places for overnight stops. And, there needs to be a designated, mapped (and possibly marked) route and a way to decimated the information to users. One state agency, The Interagency Committee for Outdoor Recreation, has proposed to develop a proposed list of water trails sometime in 1992.

Abandoned Railroads Railroad are being abandoned at an alarming rate in our state as elsewhere. Some of these abandoned railroad grade represent significant opportunities for public access to shorelines and linkages from upland areas to shorelines. For example, a recently announced abandonment runs East to West to the City of Raymond on Willapa Harbor from a the City of Chehalis (about 50 miles inland). This railroad right-of-way represents an opportunity to achieve a dream for a cross state trail that ends on the marine shoreline. While there is some interest in the project at this time, there is considerable planning and coordination needed before it can become a reality. In addition the Western terminus, the City of Raymond, is sitting on an as yet unrealized opportunity to become a waterfront oriented tourist community as former industrial waterfront using firms are ceasing operations and surplusng properties. Again, the City of Raymond needs to undergo and planning effort to capitalize on these emerging opportunities.

Existing Improvement and Maintenance Programs

No evaluations of the adequacy of existing improvement and maintenance programs are known to have been conducted.

Conclusions and Needs for Improvement

- 1) Increase the amount of funding for acquisition of shoreline public access sites. As described in the assessment, above, there is no substitute for public acquisition and development of shoreline access sites.
- 2) Encourage more innovative designs for public access opportunities provided by shoreline permit condition. Provide information to shoreline site developers on better ways to incorporate public access.
- 3) Work to provide for passage rights-of-way along the shoreline immediately above the ordinary high water mark. This may require public acquisition of easements.
- 4) Work to provide adequate opportunity for perpendicular access to the shoreline from the most immediate public thoroughfare. This may require public acquisition of easements.

5) Provide additional funding to local governments for development and adoption of modern comprehensive park, recreation, and public access plans; many funding sources (such as Washington's Interagency Committee for Outdoor Recreation [IAC]) require approved comprehensive plans as a condition of funding for acquisition and improvement projects.

Strategies

Fund local government planning projects for development and adoption of modern comprehensive park, recreation, and public access plans consistent with the criteria of the Interagency Committee for Outdoor Recreation.

Provide an improved means to assure that cities and counties are made aware of pending rail road abandonments and provide technical assistance to them in converting these to public access opportunities.

Marine Debris

4) Reducing marine debris entering the Nation's coastal and ocean environment by managing uses and activities that contribute to the entry of such debris.

Therese M. Swanson

Assessment

Identify the impact of marine debris on the coastal zone and the primary sources responsible.

No comprehensive assessment of marine debris has been carried out for Washington state. In 1988 the Commissioner of Public Lands appointed a task force of agency and organization representatives to develop a state action plan to address the increasingly important issue of marine plastic debris. The initiative was inspired by several events including: aggressive beach cleanup efforts in Texas; the (then) recent passage of federal legislation to prevent dumping plastic into the nation's waters; and a recognition that these persistent materials ultimately pollute the aquatic lands of the state (for which the Department of Natural Resources and the Lands Commissioner has management responsibility).

Consultation was made with the Department of Ecology's Waste Reduction, Recycling, and Litter Control Program and the Department of Natural Resources' Aquatic Lands Division. This section is based partly on a previously completed marine plastic debris assessment and plan (Marine Plastic Debris Task Force, 1988) and marine debris beach surveys (Adopt a Beach, 1990, 1991) which are incorporated by reference into this document.

Marine debris is any manufactured object of wood, metal, glass, rubber, cloth, paper, plastic, or other material accidentally or purposefully put into the marine environment. Of all these materials, plastic is considered to be one of the most serious contaminants. The properties of strength, durability, light weight, and low cost make plastic ideally suited for the manufacture of a growing number of products. These same properties also make plastic potentially harmful to the marine environment. Lightweight plastic floats, becoming widespread at sea and on beaches where it threatens marine mammals and birds by entanglement or ingestion. Other plastic sinks, but still endangers marine life and the safety of divers. The persistence of plastic presents another problem in the marine environment. Most plastic resists natural decay. Although it may break down smaller and smaller, those particles may affect the marine environment for years or even decades.

Primary Sources

Ships, including merchant and military vessels, cruise ships, and commercial fishing vessels contribute to the debris problem. Additionally, litter is carried to sea by rivers and municipal drainage systems and is left on the beaches by beach users.

Impact of Marine Debris on the Coastal Zone

Marine debris can kill humans (though there are no known instances in Washington) and wildlife. Divers can become entangled in submerged fishing gear and wildlife can be injured or killed from ingesting or becoming entangled in marine debris. No one knows how many birds, marine mammals, turtles, fish and invertebrates are killed each year because of marine debris. We do know that individual animals are affected by marine debris. Northern fur seal populations

on the Pribilof Islands are declining, and death from entanglement in marine debris, particularly fishing gear and strapping bands, are major contributors to this decline. Marine debris entanglement can kill up to 40,000 northern fur seals a year. Whales, porpoises, and otters also become entangled in marine debris, but effects on population levels are unknown.

One fifth of the 280 worldwide species of sea birds are known to have ingested plastic. Other birds become entangled in six-pack yokes, monofilament fishing line and other debris and then are killed. Sea turtles can mistake plastic bags and sheeting for their favorite food - jellyfish. Lost or discarded fishing nets, lines, and crab pots continue to catch and kill fish and invertebrates and endanger lives for days, months, and even years.

Plastic marine debris causes damage to commercial and recreational vessels by fouling steering, propellers, and cooling water intakes. Marine debris financially affects seaside communities. These coastal communities spend millions of dollars yearly to maintain clean beaches to attract visitors.

In 1988, Ecology's Shorelands Program contracted with Adopt a Beach to conduct surveys designed to characterize debris landing on Washington's beaches. Now in its third year, the marine debris survey can provide some preliminary information. Plastic leads the list of non-wood materials found on the beach. Disposable items occur most frequently, but polystyrene used for flotation (buoys, floats, and docking) is most common in terms of distribution and frequency of occurrence. Flotation debris is not regulated, and no effective control mechanisms are available. The debris profile seems to indicate that much of the debris sources in Puget Sound are land-based, while this is less the case on the outer coast.

The effects of MARPOL, the international marine pollution treaty which includes provisions for solid waste and other forms of marine debris formerly discharged at sea is expected to have substantial beneficial effects in the near future. Some commentators on earlier drafts of this assessment report observing less marine debris on ocean beaches in recent seasons. Other commentators report that the beneficial effects of MARPOL can be measured by the degree to which Washington's ports are required to provide additional solid waste collection services for arriving vessels.

Existing Response Programs

In 1988, the Commissioner of Public Lands, Brian Boyle, appointed the Marine Plastic Debris Task Force (MPDTF) to develop a state action plan to address the growing pollution problem in the waters of Washington. The Task Force developed twenty action recommendations. In 1989, the legislature passed a law directing the Department of Natural Resources to be the overall coordinating agency in order to encourage adoption and implementation of the Task Force's recommendations.

The Task Force focused on plastics (rather than wood, metal, glass, rubber, etc.) because it is one of the most serious contaminants. Plastic is harmful to the environment because it is strong, durable, and lightweight thus remaining in the water or on the beach for a long time.

Since 1989, the Marine Plastic Debris Program has accomplished the following: coordinated activities with other state agencies and organizations; developed educational materials for trade shows; produced curriculum guides and other children's educational materials; placed 1500 educational signs at marinas, launch ramps, and other marine public access points; distributed

over 60,000 children's coloring/activity books; instituted a grants program for local jurisdictions; and participated in the funding of the Coastweeks beach cleanup projects.

For the 1992-93 biennium, the Marine Plastic Debris Program will continue to coordinate state and federal agency involvement. If sufficient funding becomes available, the following elements will be implemented:

- Establish a state-wide beach cleanup coordinator position
- Establish a monitoring data base to provide information necessary to evaluate program success.
- Develop a K-12 public school curriculum to address the issue of marine debris and sponsor associated teacher workshops.
- Create public service announcements about the marine debris problem and solutions; develop and distribute a marine debris poster series; and provide biodegradable litter bags to the boating public and selected public schools.
- Establish a grants program for marinas to create recycling centers at their docks.
- Organize a Washington State Marine Plastic Debris Conference in 1992 to educate the affected public and create the momentum for needed legislation and funding.

Conclusions and Needed Improvements

The Marine Plastic Debris Coordinating Committee has established the following high-priority projects for the Marine Plastic Debris Program:

- Examining existing legislation dealing with the marine plastic debris issue
- Evaluating the implications of the following:
 - The Model Litter Control and Recycling Act
 - Water Quality Standards and Storm Water Guidelines
 - Marine Plastics Debris legislation

Strategies

No draft strategies have yet been adopted.

Cumulative And Secondary Effects Of Growth

5) Development and adoption of procedures to assess, consider, and control cumulative and secondary impacts of coastal growth and development, including the collective effect on various individual uses or activities on coastal resources, such as coastal wetlands and fishery resources.

Douglas Canning, Scott Boettcher, and Peter Skowlund

Assessment

Characterize the nature, type, and extent of secondary and cumulative impacts in the coastal zone.

- *Identify areas in the coastal zone where rapid growth requires improved management of potential cumulative and secondary impacts.*
- *Identify areas in the coastal zone which possess sensitive coastal resources (wetlands, water bodies, fish and wildlife habitats), and require a greater degree of protection and understanding of the cumulative and secondary impacts related to growth and development.*
- *Assess the adequacy of existing institutional, legal, and policy mechanisms (e.g. coastal development permits, local land use plans and ordinances, water quality reviews, infrastructure funding policies) that address cumulative and secondary impacts on coastal resources.*

No comprehensive assessment has been completed which addresses cumulative and secondary effects of growth upon Washington's coastal resources. This assessment has been pieced together from existing, disparate reports. What is lacking in the existing literature and documentation is a clear and comprehensive assessment and evaluation of the issues.

Coastal Areas Affected by Growth

This section is based on previously completed inventories and assessments which are incorporated by reference into this document: *Draft Land Use Issue Paper* (Washington State Growth Strategies Commission, 1990); *Growth in Washington: A Chartbook* (Pivo & Lidmann, 1990); *Population Trends in Washington State Coastal Counties* (Boettcher, 1991); *1991 Puget Sound Water Quality Management Plan* (Puget Sound Water Quality Authority, 1990); *State of the Sound 1988 Report* (Puget Sound Water Quality Authority, 1988); *Grays Harbor Estuary Management Plan*; *Willapa Bay Water Resource Management Plan*.

Puget Sound Within the Puget Sound basin's 12,800 square mile land area, (19 percent of state total), there are twelve counties that directly abut the Sound's approximately 2,400 miles of coastal shoreline. By the turn of the century, the 3.2 million people (69 percent of state total) currently residing in these counties (Whatcom, Skagit, San Juan, Island, Snohomish, King, Pierce, Kitsap, Thurston, Mason, Jefferson, and Clallam) are expected to increase by 19 percent to 3.8 million. By the year 2010, total basin-wide population is expected to exceed 4.4 million (38 percent increase). Nearly 60 percent of the Basin's thirty year growth projection is expected to result from in-migration.

The basin's patterns of growth and development have not been uniformly consistent. Different counties have experienced different kinds and rates of growth. For sake of generalization though, two broad patterns of growth and development can be described:

The "urbanized" Puget Sound counties (Snohomish, King, Pierce, Kitsap and Thurston) are experiencing strong in-filling and re-development of the coastal shoreline with single-family and multi-family structures, in addition to first-time development of interior lands converted from agriculture or forestry uses. Larger structures are being built on smaller lots. Shoreline "character" is threatened with change. Public access to shorelines is not keeping pace with population growth. Water quality is threatened by nonpoint sources including urban runoff.

The "rural" Puget Sound counties (Mason to the south, and Island, Skagit, Whatcom, and San Juan to the north) have a dominant characteristic of coastal shoreline property being purchased for vacation and retirement uses. In-filling and re-development rates are locally high in urban areas and along the shoreline areas. Public access to shorelines is not keeping pace with population growth. Water quality is threatened by nonpoint sources.

While southwest Washington's coastal counties (Grays Harbor, Pacific, and Wahkiakum) have not experienced the rate nor amount of growth occurring to the northeast, they have experienced growth and development of a localized nature, particularly in shoreline areas. Patterns and trends are described relative to the major features identified below.

Grays Harbor 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 Strait of Juan de Fuca and about 45 miles north of the mouth of the Columbia River. The estuary encompasses a 91 square mile area and receives water from the following major tributaries: Chehalis, Humptulips, Elk, and Johns. The estuary is wholly contained within Grays Harbor County. The major issue regarding Grays Harbor estuary is the management of the multiple shoreline dependent uses. These uses broadly include: (1) port facilities; (2) manufacturing; (3) transportation; (4) food industry; (5) commercial; (6) recreation; (7) residential; (8) agriculture; (9) natural areas and systems. To do this, the *Grays Harbor Estuary Management Plan*, 1986 sets forth a management process based on goals, policies, and guidelines to managing these often conflicting uses. The *Grays Harbor Estuary Management Plan* is currently being amended and will be available in early 1992.

The management plan is a good vehicle toward identifying and managing competing uses. The plan recognizes that the estuary is a delicate place and that it ought to be protected through its "Natural Areas" element. The plan also recognizes the multi-jurisdictional ownership of the estuary and seeks to coordinate these interests. A limitation of the plan however is that its coverage is limited to the immediate estuarine area, not the greater watershed area. This limitation may have implications for the health of the estuary, given that upland land use practices are not addressed in a manner that is coordinated with the plan. On the other hand, the land uses on areas removed from the immediate shoreline are predominately forestry, the regulation of which is beyond the authority of the plan.

Willapa Bay The Willapa Bay Watershed Basin consists of an 800 square mile area on the Pacific Coast that is primarily within Pacific County; a small portion lies within Grays Harbor County.

Within the basin, the Long Beach Peninsula has received a substantial portion of the basin's overall growth and development. Development on the Peninsula has primarily catered to the second home, vacation home, retirement home market. Riverine, estuarine, and marine shoreline development has raised a number of issues related to: (1) Water quality degradation as a result of poor drainage, stormwater, and on-site sewage disposal practices; (2) Water quality degradation as a result of forestry and agricultural practices; (3) Spartina infestation; (4) Sea water intrusion and the low lying water table of the Long Beach Peninsula; and (5) Treatment of the Peninsula's sand dune/wetland complex.

Summary The areas which appear to be most affected by population growth are Snohomish, King, Pierce, Kitsap and Thurston counties. However, the greatest population growth numbers do not necessarily equate to the greatest environmental or socioeconomic effect. Substantial relative effects are occurring in areas such as Island County and San Juan County.

Coastal Resources Affected by Growth

This section is based on previously completed inventories and assessments which are incorporated by reference into this document: *State of the environment report: Volume 2, Part 5; Food fish and shellfish resource characterization report, and Part 6: Fish and wildlife resource characterization report* (1989) and the *1991 State of the Environment Report*.

Wetlands Wetlands are managed by a number of state agencies; the Shorelands and Coastal Zone Management Program of the Washington Department of Ecology is the lead agency. Wetlands are addressed under Improvement Objective 1: Wetlands, at page 9.

Intertidal and Shallow Water Habitats Intertidal and shallow water habitats are considered by many to be at threat from nearby shoreline development, particularly shoreline bulkheading and other forms of shoreline armoring (see also Coastal Hazards section). A review of the literature on the effects of shoreline hardening (Terich, Schwartz & Johannessen, 1991) reported the following.

The proliferation of seawalls and other hard erosion protection structures has prompted researchers to study their possible impacts to beaches. A review of the contemporary literature shows that a majority of the published work on the subject finds seawalls in some way aggravate the pre-existing erosion of beaches. Researchers commonly concluded that seawalls change a dissipative beach into a reflective beach (Rosenbaum, 1976) leading to increased wave reflectivity and beach scour (Griggs, 1988). Silvester (1978) found the presence of seawalls to double the applied littoral energy to the sedimentary bed leading to increased scour both in front of the wall and some distance downcoast. Fisher (1986) concluded that the beach in front of seawalls all but disappears due to increased wave scour. In both laboratory and field investigations, McDougal (1987) measured the excess depth of scour erosion to approximate 10% of the seawall length. Similarly, Birkemeier (1980) indicates a one to one relationship between the depth of toe scour and incoming wave heights.

Increased littoral zone turbulence and beach scour leads to a general lowering of the beach profile (Dean, 1983) and possibly a narrowing of the beach as well. However, narrowing might also result from a reduced sediment input due to the presence of a structure (Hansen, 1986). Clayton (1988) concluded that up to 70% of the natural beach sediment supply had been reduced due to seawalls along a stretch of the English coast.

Seawalls also appear to have adverse impacts to adjacent beaches. Wave reflection and scour transfers energy stresses and reduced sediment inputs to nearby unarmored beaches (Griggs, 1988). Laboratory data revealed an along coast length of erosion to be approximately 70% of the structure length (McDougal, 1982) (Komar, 1988).

Rock rip rap is also a commonly used erosion protection structure. Unlike a seawall, rip rap tends to reduce wave reflectivity by dispersing the wave energy over the sloping multifaceted face of the rock. It appears that less work has been conducted on the effects of rock rip rap to beaches. However, Fitzgerald (1981) reported rip rap to lead to a greater frequency of wave overtopping.

Contrary to the contemporary research, Dean (1988) and O'Brien (1980) argue that seawalls are installed at sites of beach and shorebluff erosion. To conduct erosion studies at these sites and conclude that seawalls are aggravating and/or causing the erosion is incorrect. They contend that seawalls are being blamed for erosion when in fact that might not be the case.

Finally, one of the most recent definitive works summarizing the literature has been prepared by Griggs and Tait (1990). They contend that ocean response to seawalls is variable due to site specific controls and processes. The authors go on to write that field studies on the subject are limited and more study is needed. This statement is difficult to accept in light of the lengthy bibliography to follow, and the preponderance of evidence indicating the negative effects that seawalls have on beaches.

The concern over the effects of wide spread shoreline armoring is such that Mason, Thurston, and Pierce counties have requested that Ecology address the issue; see Coastal Geologic Hazards section, page 19 and 22.

Fish In Washington state, most fish are defined as “food fish” for administrative purposes and are managed by the Department of Fisheries. Sports fish are managed by the Department of Wildlife; see Wildlife Habitat section following. No comprehensive assessments of fish habitat in Washington’s coastal zone have been completed. Numerous assessments have been completed for heavily polluted embayments such as Commencement Bay, Elliott Bay, and Eagle Harbor. Population assessments have been completed for the Environment 2010 project. The following assessment is also based on the professional experience of the authors.

Intertidal and shallow water habitats are critical to the life cycle of many food fish species. Juvenile Pink and Chum Salmon depend upon shallow waters habitats throughout the state to escape predation during their out migration from the rivers to the sea. Surf Smelt are common in Puget Sound where they spawn on sand and gravel beaches high in the intertidal zone. They spawn throughout the year in various areas of Puget Sound and Hood Canal. There is also spawning along the Strait of Juan de Fuca and a small population on the Washington coast near Kalaloch. Pacific Herring commonly occur throughout Puget Sound. The adults generally spawn in late winter to early summer, depending on the geographic area and the genetic stock. Spawning is on marine vegetation (e.g. eelgrass and attached macro algae) between the +3 to -20 foot tidal elevation zone (MLLW = 0.0). Intertidal and shallow water habitats are at risk from water pollution, intertidal habitat degradation due to shoreline erosion control construction projects, and shoreline habitat conversion to urban and suburban land uses.

Shellfish Shellfish management is shared by a number of state agencies including the Department of Natural Resources, the Department of Fisheries, the Parks and Recreation Commission, the Department of Health, and the Department of Ecology. The status of Puget Sound commercial shellfish beds were assessed based on annual Washington Department of Health reports for Ecology's *1991 State of the Environment Report*. Substantial shellfish beds are also found in Willapa Bay and Grays Harbor, but no comparable data for those areas are available. The *1991 State of the Environment Report* indicates the following.

Approximately two thirds of the Puget Sound shellfish beds are in the North Sound, about one fifth are in the South Sound, and the remainder (about one seventh) are in Hood Canal.

The overall trend for Puget Sound is a decrease in the relative amount of Approved shellfish beds and an increase in the relative acreage of Conditionally Approved, restricted, and Prohibited beds. There has been a steady increase in the total acreage of shellfish beds. The trends for the North Sound essentially mirror the overall pattern. In the South Sound, the data are confused by relatively large additions to the base acreage, but there has been a steady increase in the acreage of Conditionally Approved, Restricted, and Prohibited shellfish beds. Conditions in Hood Canal have remained relatively stable with slight declines in Approved areas and slight increases in Conditionally Approved, Restricted, and Prohibited shellfish beds.

The leading causes of shellfish contamination throughout Puget Sound is nonpoint pollution including urban runoff and general residential effects. In the North Sound, marinas and boating, and sewage treatment plants (STPs) are secondary causes, with animal waste being cited only once. In the South Sound, marinas and boating, animal waste, and STPs are all secondary causes. In Hood Canal, only one problem is attributed to something other than nonpoint pollution, and that one to boating.

Wildlife Habitat Wildlife habitats, including sports fish habitats are managed by the Department of Wildlife. No comprehensive assessments of coastal wildlife habitat in Washington's coastal zone have been completed. Population assessments have been completed for the Environment 2010 project. The following assessment is also based on the professional experience of the authors.

The coastal habitat of greatest concern (aside from coastal and estuarine wetlands) are sandspits. The following threatened, endangered, or sensitive species are associated with sandspits in Washington state: Bald Eagle; Merlin; Peregrine Falcon; and Snowy Plover. The Shorelands and Coastal Zone Management Program is just completing an inventory and characterization of sandspits and other coastal accreted landforms; few undeveloped sandspits remain.

The *State of the Environment Report* (1989) indicates the following about coastal sports fish.

Anadromous fish in Washington state are threatened by changes and loss in habitat in both fresh and saltwater areas. Stream and shoreline degradation, loss of shallow areas in estuaries, water pollution, and decreased water flows have all contributed to the decline of these fish runs. In many areas, upstream and downstream migration of anadromous fish is blocked by dams and other instream structures. Overharvest of wild/natural stocks and genetic interactions with hatchery fish are also significant factors in determining the

health of these populations. Predation from an increasing population of marine mammals is also a problem.

Aesthetics and Open Space No comprehensive assessment of coastal zone aesthetics or open space has been conducted in Washington state. The following review is based on the impressions and professional experience of the authors.

A quick viewing of the Washington's coastal shorelines shows that urban and suburban shorelines are increasingly being developed and permanently altered. Bulkheading (and other forms of shoreline hardening) of residential properties and even public parks is becoming the norm. From an aesthetic and open space perspective the Washington's shorelines are forever losing their natural character, their fish and wildlife habitat, their protective systems, their accessibility to the public at large, and their visual appeal. Some portions of Puget Sound are no longer visible from upland locations due to view blockage created by dense or intense shoreline development. This trend could be alleviated through more rigorous local requirements concerning public access, development set-backs, and alternative construction standards. Additionally, removal of the bulkheading exemptions in the SMA would also help.

There are presently no state or local programs designed to address coastal zone open space in a comprehensive manner.

Summary The coastal resources which appear to be most at risk from population growth are estuarine and coastal wetlands, intertidal fish and shellfish habitat, and estuarine water quality particularly with respect to shellfish culture. Additionally, in urban and suburban areas, the loss of open space is an increasing problem as is deteriorating shoreline aesthetics due to large scale shoreline hardening.

Existing Institutional Mechanisms

This section is based on previously completed inventories and assessments which are incorporated by reference into this document: *Technical assistance paper: Integrating growth management with shorelines management* (Trohimovich, 1991a); *Shoreline Management Act and Growth Management Acts: Summary of 36.70A, issues, and opportunities* (Trohimovich, 1991b); *Planning Data Source Book For Resource Lands and Critical Areas* (Growth Management Division, 1991); *1991 Puget Sound Water Quality Management Plan*; *State of the Sound 1988 Report*.

Shoreline Management Act (SMA) The SMA provides a framework and uniform set of rules for guiding cooperative state/local planning and management of reasonable and appropriate shoreline uses. The SMA recognizes preferred shoreline uses as those that: (1) protect environmental and water quality; (2) depend upon shoreline proximity; and (3) preserve and enhance public access or increase public recreational opportunities. Local governments have primary responsibility for implementing the SMA through local plans called Shoreline Master Programs (SMP). Local governments regulate and permit development consistent with the adopted local SMP. The Department of Ecology reviews and adopts local SMPs once locally developed. Disputes are handled by the State Shorelines Hearings Board. The SMA currently exempts: (1) development or construction activity under \$2,500; (2) normal maintenance or repair of existing structures or developments; (3) construction of normal protective bulkheads; (4) emergency construction; (5) single-family residential development; and (6) private dock construction.

The “single-family exemption” was identified in focus group discussions as a particular weakness in the SMA and local Shoreline Master Programs.

SMA jurisdiction is applicable to lands within 200 feet of the ordinary high water mark of salt water and specific fresh waters, namely lands abutting a stream with a mean annual flow of at least a 20 cfs or lakes with a surface area of at least 20 acres. It also applies to certain floodplain areas and “associated” wetland areas.

Growth Management Act (GMA) The GMA requires that counties with populations greater than 50,000, or counties where population increased by more than ten percent in the previous ten years prepare, adopt, and implement local comprehensive land use plans and development regulations. Plans are to be implemented through consistent local planning policies, development regulations, and capital budgets. After July 1, 1992 local governments not planning under the GMA must insure that local development regulations are consistent with adopted comprehensive plans.

Additionally, the Acts require all local governments to identify natural resource lands and critical areas. All local governments must protect critical areas. Critical areas include: (1) wetlands; (2) floodplains; (3) aquifer recharge areas; (4) fish and wildlife conservation areas; and (5) geologically hazardous areas. The natural resources of state-wide significance program is still under development.

State agencies are to comply with local planning policies and comprehensive plans. Disputes are handled by regional Growth Planning Hearings Boards. The Act requires comprehensive planning to be coordinated with adjoining jurisdictions and implemented consistent with the adopted plan. All coastal zone counties except Grays Harbor and Wahkiakum are either required to plan under the act or have chosen to do so to gain access to planning grants.

The Shoreline Management Act and the Growth Management Act are complimentary. The SMA focuses on shoreline resources of regional and state importance and includes significant state oversight. The GMA focuses on community-wide land use planning and has less state oversight. Neither law preempts or amends the other. Shoreline master programs are minimums that local governments can exceed in other development regulations.

Puget Sound Plan The Puget Sound Plan, developed by the Puget Sound Water Quality Authority, is a comprehensive plan designed to protect the Sound’s water quality. The Plan’s purpose is “to restore and protect the biological health and diversity of Puget Sound.” The Plan’s strategy is to “protect and enhance the Sound’s water and sediment quality; its fish and shellfish; and its wetlands and other habitats.” To do this the Plan addresses such elements as: (1) overall estuary management; (2) fish and wildlife habitat protection; (3) oil spill prevention and response; (4) Education and public involvement; (5) non-point source pollution; (6) shellfish protection; (7) wetlands protection; (8) municipal and industrial discharges; and (9) stormwater and combined sewer overflows. Plan implementation is carried out jointly by affected federal and state agencies and local jurisdictions.

The Puget Sound Plan’s major shortcoming is that it lacks the authority to require local implementation. The Puget Sound Water Quality authority, in the opinion of the State Attorney General’s Office, is “... limited to making recommendations ...”.

Centennial Clean Water Act The Centennial Clean Water Fund Program (CCWF) establishes a fund (the Water Quality Account) to meet future water pollution control requirements. The Water Quality Account is financed primarily through taxes on tobacco and cigarette products. The

Department of Ecology provides technical and financial assistance to public entities to address public health and water pollution problems. Facilities and activities funded include wastewater treatment facilities, lakes restoration, ground water protection, agricultural pollution controls, watershed planning, and other non-point source pollution control projects.

The demand for CCWF funds frequently exceeds their availability, placing restrictions on the overall effectiveness of the program.

Hydraulic Project Permit Under the Washington Hydraulic Code, the Department of Fisheries and the Department of Wildlife are jointly required to regulate activities which use the marine and fresh waters of the state. The Department of Fisheries exercises jurisdiction over marine waters, and the two departments share jurisdiction over fresh waters, though one agency will assume lead status over fresh waters depending on the location of the proposed project.

Regulation is implemented through the Hydraulic Project Approval (HPA) process. Therefore, any coastal shore protection works constructed waterward of the line of ordinary high water come under the jurisdiction of the Department of Fisheries, and will require an HPA. (Shore protection works constructed along streams and lakes may also require a Hydraulic Project Permit.)

The primary function of the Hydraulic Code is to protect the state's fisheries resources. Thus the Department of Fisheries' rules for the regulation of shore protection works prohibits filling or construction on beach areas critical to fish migration, rearing, or spawning. The lower limits of shoreline filling permitted by the Hydraulic Code rules (Chapter 220-110 WAC) varies throughout the Puget Sound depending on tidal elevation patterns and the fish species' habitat under protection. Each specific project application requires a determination by the Department of Fisheries as to the governing design criteria. Therefore, it is imperative that applicants contact the Department of Fisheries prior to beginning design engineering.

An Hydraulic Project Approval is required for both new construction and repair of old or damaged shore protection works. Approved HPAs will ordinarily carry strict limitations on the time of year during which construction activities may be carried out.

Conclusions and Needed Improvements

From the foregoing discussion it is clear that the cumulative and secondary impacts of coastal growth are greatly in need of attention. The impacts and necessary measures to address such impacts have yet to be studied in detail and are therefore not well understood. Clearly there is a need to carry out comprehensive cumulative effects studies in many areas before informed decisions can be made regarding regulatory changes.

Existing policy contained in the Shoreline Management Act and the Growth Management Act appears sufficient in most respects for addressing the cumulative and secondary impacts of growth, especially in conjunction with ancillary programs such as the Puget Sound Plan or the Centennial Clean Water grants. Consideration of growth related issues are integral to the state-wide planning efforts of both the Shoreline Management Act (SMA) and the more recently enacted Growth Management Act (GMA).

Basic research into the legal relationships between shoreline management and growth management in Washington state has been recently completed (see Trohimovich papers referenced earlier). However, an assessment of the most appropriate delivery mechanism for providing growth and cumulative impact related assistance to local (and state) regulators is lacking.

Improved coordination amongst state agency and local government regulators is needed to effectively implement measures that will control the cumulative impacts of growth on coastal resources. In light of recent GMA requirements to update local comprehensive plans and regulations there exists at this time, a unique opportunity to incorporate strategies to control cumulative impacts into adopted policies and regulations. To do this however, direct technical assistance (even more than financial assistance) to local governments and others is needed. Where assistance is provided, implementation will logically include enhancement of existing shoreline master programs (consistent with CZM policy) and new SEPA sensitive area ordinances to address GMA critical areas and the cumulative impacts of growth on coastal resources. Interdisciplinary approaches and agreements between Federal, state, and tribal interests may also be necessary to coordinate and enhance efforts to address cumulative impacts.

One area clearly in need of improvement is the development of guidelines for protection of critical areas, the identification of and development of management strategies for resources of statewide significance, and the preparation of procedural criteria under the new GMA.

Another issue is the need to address the cumulative effects of single family residential development and bulkheading as evidenced by a request from the Thurston County and Mason commissioners to the Department of Ecology that a programmatic environmental impact statement be prepared. The cumulative and secondary effects of wide spread shoreline armoring are discussed in the Coastal Geologic Hazards section at page 22.

Strategies

Ecology would address the integration of Shoreline Management Act and Growth Management Act regulatory programs, at both the state and local government levels, particularly through critical area guidelines, procedural criteria, and natural resources of state-wide significance management should be addressed. These efforts would be carried out in cooperation with the Department of Community Development, other state resource agencies, and local governments as appropriate.

The cumulative and secondary effects of wide spread shoreline armoring (bulkheading) is discussed under the Strategies heading of Coastal Geologic Hazards section at page 22.

Special Area Management Plans

6) *Preparing and implementing special area management plans for important coastal areas.*

Steve Craig and Douglas J. Canning

Assessment

Identify areas of the coastal zone subject to use conflicts that can be addressed through special area management planning. Criteria for selecting these areas should include:

- *The area includes significant coastal resources that are being severely affected by cumulative or secondary impacts from coastal growth.*
- *There is a multiplicity of local, state, and federal authorities which prevents effective coordination and cooperation in addressing coastal development on an ecosystem basis.*
- *There is a history of long-standing disputes between local, state, or federal agencies over certain coastal resources which have resulted in protracted negotiations over the acceptability of proposed uses.*
- *There is a strong commitment at all levels of government to enter into a collaborative planning process to produce definitive regulatory products.*
- *A strong state or regional entity exists which is willing and able to sponsor the planning program.*

The 1976 Washington State Coastal Zone Management Program identifies the following as Areas of Particular Concern:

1. Nisqually Estuary
2. Hood Canal
3. Snohomish River Estuary
4. Skagit and Padilla Bays
5. Dungeness Bay and Spit
6. Grays Harbor
7. Willapa Bay
8. Pacific Coastal Dune System
9. the Continental Shelf
10. the Northern Strait and Puget Sound Petroleum Transfer and Processing Area

The 1979 amendments to the Washington State Coastal Zone Management Program identify Toke Point (Willapa Bay) and Ediz Hook (Strait of Juan de Fuca) as Areas of Particular Concern with respect to erosion control and mitigation.

“Areas of Particular Concern” were identified according to the following criteria:

- (1) the area contains a resource feature of environmental values considered to be of greater than local concern or significance; (2) the area is given recognition as of particular concern by state or federal legislation, administrative and regulatory programs, or land ownership; and (3) the area has the potential for more than one major land or water use or has a resource being sought by ostensibly incompatible users.

Areas of Particular Concern Assessment

Following is a review of the status of planning and management for the previously identified “areas of particular concern.”

Nisqually Estuary The Nisqually River, delta, and estuary system is addressed, to varying degrees, by a number of plans and programs.

To a large degree, the Nisqually delta is protected by its status as a national wildlife refuge which was established in 1972. The estuarine waters of Nisqually Reach come under no special management program other than basic state and federal regulations. Some citizen groups are working to establish a separate Estuarine Research Reserve at Nisqually Reach and adjacent waters; this is likely inconsistent with the existence of an estuarine research reserve at Padilla Bay within the same ecosystem.

Since 1978, the Nisqually River Coordinating Committee has a research and negotiating forum for the resolution of competing fisheries and hydropower interests. The NRCC was established by order of a Federal Energy Regulatory Commission administrative law judge, and is composed of representatives of Tacoma City Utilities, Centralia City Light, the state departments of Fisheries and Wildlife, and the Nisqually Indian Tribe.

The 1985 Washington Legislature authorized the development of a Nisqually River management plan which was approved in 1987. The plan is administered by a non-regulatory Nisqually River Council consisting of representatives of affected tribal, federal, state, and local agencies and representatives of the Nisqually Citizen Advisory Committee. A private, nonprofit Nisqually River Basin Land Trust has also been formed. Accomplishments of the Nisqually River program (both direct and indirect include:

- establishment of a coordinated, basin-wide water quality monitoring program;
- establishment of an environmental education program for the basin’s secondary schools centered on the Yelm School District;
- acquisition of lands at the Mashel - Nisqually confluence which will form the basis of a new state park; and
- provision of a forum for debating land use and natural resource management issues in the basin.

The Nisqually River Management Program is often regarded as a model for management efforts in other river basins in the state.

Hood Canal This fjord of western Puget Sound receives special management attention through the Hood Canal Coordinating Council, a consortium of Kitsap, Mason, and Jefferson counties and the Skokomish and S’Klallam Indian tribes, and the Hood Canal Environmental Council, a citizen activist group. During the past two years the *Bremerton Sun* prepared a series of articles on the Hood Canal and its adjacent lands which has been reprinted in book form as *Hood Canal: Splendor at Risk* in November 1991, and which is incorporated by reference into this report. Broadly speaking, the problems associated with Hood Canal are centered on water pollution (as evidenced by shellfish bed closures), with the causes centered on the cumulative effects of population growth. The contributing factors include residential development clustered on the shorelines, failing onsite sewage system drainfields, and related land use practices.

Snohomish River Estuary The Snohomish River Estuary has had no special area management plan prepared, but has received special planning attention since 1976 by the US Army Corps of Engineers, Snohomish County, and the state resource agencies largely related to flooding issues. The Shorelands and Coastal Zone Management Program has been assisting Snohomish County in acquisition of wetlands in the Snohomish delta.

Skagit and Padilla Bays Padilla Bay is protected to a large degree by the Padilla Bay Estuarine Research Reserve. Skagit Bay has not been the subject of any special planning efforts in the past. Presently, Skagit County is carrying out an investigation and analysis of the effects of the 1990-91 winter flooding, including the future risks associated with storm surge, sea level rise, geologic hazards, land subsidence, etc., for the purpose of developing the appropriate Shoreline Master Program amendments.

Dungeness Bay and Spit Dungeness Bay and Spit are protected, to a degree, by their status as a national wildlife refuge. No other special planning programs have been initiated.

Grays Harbor Grays Harbor is the locale of the only formal Special Area Management Plan in Washington state. The Grays Harbor Estuary Management Plan is was developed by a local - state - federal task force between 1977 and 1984. Participants included:

Local Government

Grays Harbor County
City of Aberdeen
City of Cosmopolis
City of Ocean Shores
City of Westport
Port of Grays Harbor
Grays Harbor Regional Planning Commission

State Agencies

Ecology
Fisheries
Game
Natural Resources

Federal Agencies

Army Corps of Engineers
Environmental Protection Agency
Fish & Wildlife Service
National Marine Fisheries Service

The plan is a long-range, coordinated, comprehensive plan designed to guide future land and water use activities in the Grays Harbor estuary. It was intended to be implemented through the local government Shoreline Master Programs and other ordinances.

Willapa Bay At Willapa Bay the Department of Ecology Shorelands and Coastal Zone Management Program and Pacific County are cooperatively undertaking initiatives to address major environmental and land use problems and to improve state - local relationships. This initiative began in 1986 when due to a financial crisis, Pacific County faced curtailment of many basic services, including its Planning Department which administers the county's Shoreline Master Program. Ecology responded to the County's request for assistance by funding administration of the Planning Department and special planning projects with federal Coastal Zone Management grant funds. Since then, other local governments and state agencies have joined the initiative.

The decline of the forest products and salmon sport fishing industries which led to the County's financial crisis, also required that local citizens, business persons, and political leaders focus on the remaining elements of the local economy—aquaculture and tourism. Recognizing the need to

maintain a quality environment in support of their resource based economy, local leaders have increasingly supported the joint County - Ecology programs.

Willapa Bay is the most unpolluted Pacific Coast estuary, and is the source of over 50 percent of Washington's oyster production. The 28 miles of Long Beach Peninsula beaches represent over half the state's coastal dunes, attracting three million visitors annually.

Shorelands and other Ecology programs have collaborated with Pacific County, and other local governments, often in conjunction with other state and federal agencies, to carry out a number of projects related to Willapa Bay. Paramount among these is a program based on a recommendation of the Peninsula Citizens Task Force in the Peninsula Comprehensive Plan, a Willapa Bay water quality coordination effort. Willapa Bay water quality was also identified as a priority issue in Ecology's 1987 Water Quality Protection Needs Evaluation report to the Legislature. A citizen- and industry-based Willapa Bay Water Quality Organization Committee issued their *Willapa Bay Water Resource Management Plan* in October 1990, including a recommendation for a permanent coordinating council. Shorelands provided initial financial and technical assistance in 1988-89. Since then Pacific County has acquired state Centennial Clean Water Act funds to expand their efforts and has established a permanent advisory committee.

Pacific Coastal Dune System The Long Beach Peninsula was the subject of two planning studies. During 1987 a *Peninsula Citizens Task Force* developed a comprehensive plan for the Long Beach Peninsula. Shorelands provided financial and technical assistance. The Plan addresses land use, economics, natural resources, wetlands, transportation, recreation, historical preservation, and County government. The Task Force completed their work in October, 1987; the County Commissioners held public hearings throughout 1988, and adopted the Plan in March 1989. Ecology continues to provide assistance to address priority concerns identified in the planning process. Based on a recommendation of the Peninsula Citizens Task Force, a citizen advisory committee was formed to draft management recommendations for the Long Beach Peninsula dunelands as a continuation of the Comprehensive Plan program. Shorelands provided financial and technical assistance. Following a public information meeting in January 1987, the first Citizens Advisory Committee meeting was held in February 1988. The plan, completed in June 1989, addresses public education; land use jurisdiction and enforcement; funding; economic and environmental resource values; land development practices and densities; and public safety. The Pacific County Commissioners are in the process of review and adoption. No similar planning process has been carried out elsewhere for the coastal dunes system.

Continental Shelf Continental Shelf issues have been addressed to varying degrees by the Shorelands and Coastal Zone Management Program and other agencies in conjunction with outer continental shelf oil and gas leasing studies during the past five years. All studies deemed necessary or desirable have not been completed, and no special area management plan has been prepared. Continental shelf issues are specifically addressed under objective seven, Ocean Resources.

Northern Strait and Puget Sound Petroleum Transfer and Processing Area This region has received special attention in the mid- to late-1970s when two oil transshipment and pipeline projects were proposed for licensing. The applications were denied; no special area management plans were completed. A portion of this area in the vicinity of the San Juan Islands is presently proposed as a National Marine Sanctuary.

Toke Point and Ediz Hook Erosion problems at these sites have been addressed through large scale sea wall construction programs carried out by the US Army Corps of Engineers.

Conclusions and Needed Improvements

No comprehensive needs assessment for special area management planning has been completed. The following assessment is based on the knowledge of professional staff within the Shorelands and Coastal Zone Management Program, responses to the Section 309 questionnaire in the November *Coastal Currents*, and commentary received at the Section 309 focus groups.

Willapa Bay As noted above Willapa Bay has been the object of considerable local attention regarding water quality. Additionally, The Nature Conservancy has been evaluating Willapa Bay and its watershed as the object of some form of special attention in the context of TNC's global biosphere program. In the past Willapa Bay has been considered as a potential locale for a National Estuarine Research Reserve.

Agencies with authority over Willapa Bay and its drainage basin include:

Local Government

City of Raymond
City of South Bend
Pacific County
Grays Harbor County

State Agencies

Ecology
Fisheries
Natural Resources
Wildlife

Tribal Government

Shoalwater Indian Tribe

Federal Agencies

Environmental Protection Agency
Fish & Wildlife Service

Port Districts

Willapa Harbor
Peninsula

Skagit River Basin The Skagit River is the largest river in western Washington north of the Columbia River. It originates in Canada and flows from the North Cascades, draining a 3,100 square mile area as it makes its way to northern Puget Sound Waters. The Skagit is one of few rivers in Washington to have federal Scenic River status.

The Skagit River system is thought by many at a critical point in terms of its status as a viable river resource. Alleged over cutting of timber along the river and its tributaries has reportedly had a heavy impact on fisheries as numerous critical salmon spawning beds have been destroyed by winter flooding. Many tributary streams that were just a few years ago full of fish now virtually have none. Winter flooding has been extensive in the Skagit River delta in recent years resulting in millions of dollars damage to levees and surrounding farm property.

Twelve small hydropower projects are proposed for tributaries of the Skagit River. These proposals are controversial with the environmental community because of potential threats to salmonid stocks native to the affected streams.

This, combined with the spotted owl controversy involving the timber industry, as well as rapid residential and commercial growth throughout the river basin, and in particular on the richly fertile delta area, has created a situation where there are many river use conflicts. For example:

- Should there be special limitation on timber cutting in the river basin or special timber harvest planning to address water resources and flooding issues?
- Should the levees in certain instanced be removed to absorb the shock of winter floods and to enhance riverine wetlands, or should levee systems be expanded and enhanced
- Are current land use regulations along the river adequate?

These and other related issues involving local, state, and federal agencies makes it imperative that on-going management coordination between these entities occur.

Agencies with authority over the Skagit River basin include:

Local Government

City of Mount Vernon
 City of Burlington
 City of Sedro Wooley
 City of Concrete
 Skagit County
 Whatcom County
 Snohomish County

State Agencies

Ecology
 Fisheries
 Natural Resources
 Parks & Recreation
 Wildlife

Federal Agencies

North Cascades National Park
 Mt. Baker-Snoqualmie Nat'l Forest
 Fish & Wildlife Service
 Environmental Protection Agency

Tribal Governments

Upper Skagit Tribe
 Sauk-Suiattle Tribe

Nooksack River Basin The Nooksack River flows into Northern Puget Sound from its source in the federal Mount Baker Wilderness area in the North Cascade Mountains. This 826 square mile river basin is the first river system encountered along the Interstate 5 highway corridor as one enters the United States from Canada. At its mouth, the Nooksack River passes through the Lummi Indian Reservation.

Local, state, and federal jurisdictions are increasingly involved with many of the issues encountered on other river systems in Western Washington. Population growth and accompanying development pressures on the river resources are becoming more acute.

Seven small hydropower projects are proposed for tributaries of the Skagit River. These proposals are controversial with the environmental community because of potential threats to salmonid stocks native to the affected streams.

Extensive timber harvesting, impacts on fisheries and water quality, winter flooding, and land use conflicts are contributing to the need for integrated multi jurisdictional planning and coordination.

Agencies with authority over the Nooksack River drainage basin include:

Local Government

City of Bellingham
Whatcom County
Skagit County

State Agencies

Ecology
Fisheries
Natural Resources
Wildlife

Tribal Governments

Lummi Indian Tribe
Nooksack Indian Tribe

Federal Agencies

North Cascades National Park
Mt. Baker-Snoqualmie National Forest
Fish & Wildlife Service
Environmental Protection Agency

Additionally, a portion of the Nooksack River drains the Province of British Columbia, Canada.

Chehalis River Basin The Chehalis River has diverse origins in the Puget Sound lowlands, the western flanks of the Cascade Range, and the Willapa Hills of southwest Washington. This river drains more than 2,000 square miles before flowing into the Pacific Ocean. Forestry, agriculture, and fisheries are the primary resource activities along its length.

The Coastal Zone Management Program has over the past decade supported development of the Grays Harbor Estuary Management Plan which is now in its implementation phase. This plan covers a limited area surrounding the mouth of the Chehalis River in the Grays Harbor Estuary. It is the only such plan in place in the State of Washington.

Considerable effort has been directed in recent years into determining why fish runs in the Chehalis River have declined. There has been no reasonable explanation for the decline and investigations are now underway to see if water quality is a factor. This effort has involved state and federal resource agencies.

Concerning flooding, land use impacts, fisheries, logging, and other related issues, an attempt is now underway to form a Chehalis River Council similar to the Nisqually River Council. Again, as noted with the other river basins described here, there is a great need to foster coordinated planning and management efforts at the local, state, and federal level.

Agencies with authority over the Chehalis River basin include:

Local Government

City of Centralia
City of Chehalis
City of Elma
City of Montesano
City of Aberdeen
Lewis County
Grays Harbor County
Thurston County
Mason County

Tribal Governments

Chehalis Indian Tribe

State Agencies

Ecology
Fisheries
Natural Resources
Wildlife

Federal Agencies

Environmental Protection Agency
Fish & Wildlife Service
National Flood Insurance Program

Hood Canal As both a shoreline and a marine water body, Hood Canal continues to be the object of environmental concern despite the efforts of the Hood Canal Environmental Council, a citizen activist group, and the Hood Canal Coordinating Council, a coalition of the three county governments and two Tribal governments with jurisdiction over the canal. In a series of articles compiled in *Hood Canal: Splendor at Risk* (incorporated herein by reference), the Bremerton Sun identified concerns centering on water resources, wetlands, logging, wildlife, the salmon fishery, oysters and water quality, the presence of the US Navy, recreation use and over use, and land development trends and practices. The Sun concluded by identifying a range of specific needs under the broad headings of:

- watershed protection efforts ranging from incentives to minimize impervious surface to enhanced forest practice regulations to a prohibition of shoreline bulkheading;
- Marine Sanctuary status for Hood Canal through federal action;
- stewardship over fish and shellfish;
- an expanded Hood Canal Coordinating Council to include state and federal agencies;
- research programs dedicated to addressing Hood Canal marine resource management issues;
- public education efforts including interpretive centers, class room education, and informal education such as watershed boundary signage.

Agencies with authority over Hood Canal and its drainage basin include:

<i>Local Government</i>	<i>State Agencies</i>
Kitsap County	Ecology
Mason County	Fisheries
Jefferson County	Natural Resources
Tacoma Public Utilities	Health
	Parks & Recreation
<i>Tribal Governments</i>	Wildlife
Skokomish Indian Tribe	
S'Klallam Indian Tribe	<i>Federal Agencies</i>
	US Navy, Bangor
<i>Port Districts</i>	Olympic National Park
Allyn	Olympic National Forest
Tahuya	Environmental Protection Agency
Hoodsport	Fish & Wildlife Service

Puget Sound While the Coastal Zone Management Act and the Shoreline Management Act have fostered local planning, most of the attention has been paid to the upland rather than the beach, nearshore, or deep water habitats. The departments of Ecology and Natural Resources, along with the Environmental Protection Agency and the Army Corps of Engineers have done some cooperative planning under the Puget Sound Dredge Disposal Analysis (PSDDA) program. However, other subjects such as outfalls, marinas, aquaculture sites, contaminated sediment storage sites, and aquatic restoration sites (to name a few) all would benefit from regional special area management plans. The benefit might come in the form of a reduction in time needed by an applicant to obtain judgement on a permit application, and a increase in the comfort level of government that resource or human use conflicts had been minimized and that a proper decision had been rendered. The existing level of planning is not sufficient to address the detailed regional needs. For example, in south Puget Sound (south of the Tacoma Narrows), there are numerous commercial clam and oyster beds closed to harvest or threatened with closure. The Department of Natural Resources administers a large geoduck clam resource in this region potentially threatened by outfalls or other conflicting uses. Similarly, the Department of Natural Resources administers a large geoduck clam resource along the eastern shore of the central Puget Sound basin (Tacoma Narrows north to Admiralty Inlet) potentially threatened by outfalls or other conflicting uses.

<i>Local Government</i>	<i>State Agencies</i>
appropriate city government	Ecology
appropriate county government	Natural Resources
	Fisheries
<i>Tribal Government</i>	
appropriate Tribal government	<i>Federal Agencies</i>
	Environmental Protection Agency
	Fish & Wildlife Service

Urban Bays Bellingham Bay, Commencement Bay, Port Gardner, Elliott Bay, and Budd Inlet are all urban bays with a close proximity of industrial pollution and fish bearing streams or rivers. These areas are now or will soon be subject to Natural Resource Damage actions under the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Model Toxics Control Act (MTCA). Siting of restoration sites along with other uses of the bays will require detailed planning actions by all interested parties so as to insure that future non polluting commercial activities do not physically displace any mitigation or restoration areas. In addition there is already pressure for use of state owned aquatic land for storage of contaminated sediment. Such sites must be considered in the context of the other uses of the area and the liability it places on the state for future cleanup.

Agencies with authority over urban bays include:

<i>Local Government</i>	<i>State Agencies</i>
appropriate city government	Ecology
appropriate county government	Natural Resources
	Fisheries
<i>Tribal Government</i>	<i>Federal Agencies</i>
appropriate Tribal government	Environmental Protection Agency
	Fish & Wildlife Service

North Puget Sound Oil Trans-shipment and Pipeline Region The Northern Strait and Puget Sound Petroleum Transfer and Processing Area was identified as an Area of Particular Concern in the 1976 CZMP. Presently, there is a tentative proposal by Trans Mountain Oil Pipeline Company to construct an oil off loading terminal in Clallam County, and a pipeline from the terminal across Clallam, Jefferson, Island, and Skagit counties to the refineries in Whatcom County. The state Energy Facilities Site Evaluation Council (EFSEC) has preemptive authority over the licensing of energy facilities.

Agencies affected by the proposed terminal and pipeline include:

<i>Local Government</i>	<i>State Agencies</i>
Clallam County	Ecology
Jefferson County	Fisheries
Island County	Natural Resources
Skagit County	Wildlife
Whatcom County	Parks and Recreation
<i>Tribal Governments</i>	<i>Federal Agencies</i>
Lower Elwha Klallam	Fish and Wildlife Service
Jamestown Klallam	Environmental Protection Agency
Port Gamble S'Klallam	Army Corps of Engineers
Swinomish	

Strategies

None of the above areas are proposed for special area management planning at this time. The request for special area management planning must be a voluntary joint proposal by all the affected governments and agencies.

At such time as that mutual desire develops, this assessment and strategy will be amended.

Ocean Resources

7) *Planning for the use of ocean resources.*

Therese M. Swanson

Assessment

Characterize current and prospective ocean resources and uses of state concern, and specify existing and future use conflicts.

- *Inventory ocean resources that are important to the state.*
- *Identify current and probable near-term and long-term ocean uses. Describe the intensity of those uses and the extent and severity of conflicts (both current and anticipated) among the various activities.*

While we recognize that the statutory language for this improvement objective is “planning for the use of ocean resources” we would like to point out that Washington’s ocean program will emphasize management and protection of marine resources. Our management plan will address and consider ocean uses where appropriate.

Introduction—Existing Programs

In May, 1989, the Washington State Legislature passed the “Ocean Resources Management Act.” That Act imposed a six-year moratorium on leasing Washington’s marine waters for oil and gas exploration, development, or production. Additionally, the Legislature directed the Departments of Ecology and Natural Resources, for that six-year period, to complete an analysis of the potential positive and negative impacts of the leasing of state-owned lands.

Currently, Washington does not have a unified “ocean program” that is conducted out of one office or agency. Rather, various state agencies operate pursuant to specific legislative and administrative mandates which address ocean issues. Washington State has many agencies and institutions that deal with marine and ocean issues. The Department of Ecology administers the Shoreline Management Act, which gives the local coastal governments’ Shoreline Master Programs jurisdiction out to three miles. Additionally, the Ocean Resources Management Act applies to the coastal counties and is implemented through the Ocean Use Guidelines, which will be incorporated into the Shoreline Master Programs.

The Department of Ecology has primary responsibility for oil and gas development issues and develops State policy on such issues. In developing such policy, Ecology works with various state and federal agencies, Indian Tribes, and members of the public. Additionally, Ecology is the lead agency in development of the State’s position on the Western Washington Outer Coast National Marine Sanctuary. Ecology’s ocean policy coordinator works with the Governor’s staff in responding to the Department of Interior’s five-year oil and gas leasing program. Additionally, the coordinator is the lead staff on the Olympic Coast National Marine Sanctuary and support staff on the proposed Northwest Straits/San Juan Islands Marine Sanctuary.

The Department of Natural Resources is the leasing agency responsible for Aquatic Lands. The Department of Wildlife has jurisdiction over some fisheries plus marine mammals. The Department of Fisheries is responsible for managing and regulating fisheries.

The Department of Wildlife has jurisdiction over seabirds and shorebirds, marine mammals and game fish (steelhead trout). The Department of Fisheries has responsibility for commercial and recreational fisheries and shellfish harvesting. The Department of Natural Resources leases and manages aquatic lands and protects and manages aquatic plants (e.g. kelp). The Parks and Recreation Commission is delegated authority under the Seashore Conservation Act over certain aspects of ocean beach management.

The Department of Community Development is interested in coastal development programs and in the socio-economic aspects of various marine/ocean issues. DCD also has limited oversight over implementation of Washington's new Growth Management Act.

The State Parks and Recreation Commission has jurisdiction over the number of state parks along Washington's coast.

The federal agencies that play a role in our marine affairs are numerous and principally include: National Oceanic and Atmospheric Administration, Minerals Management Service, Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, and US Army Corps of Engineers.

Federal Consistency Clause of the Coastal Zone Management Act

Ecology currently uses federal consistency under Section 307 of the Coastal Zone Management Act in reviewing applicable federal agency actions. The state's jurisdiction extends out to the three-mile territorial sea. Local government's master program provisions under the state Shoreline Management Act apply to that area.

Ecology will use federal consistency in reviewing any federal programs that affect our coast, e.g. Interior's five-year plans. Washington's authorities under its approved Coastal Zone Management Program, including the Shoreline Management Act and the Shoreline master program provisions, the Clean Water and Air Act, and SEPA will be used as part of that review.

Ocean Resources of Importance

No comprehensive assessment of Washington's ocean resources has yet been completed. This assessment is based upon the professional experience of the authors and a number of focused assessments which are incorporated by reference into this report: Bottom, et al., 1989 (*Management of living marine resources: A research plan for the Washington and Oregon continental margin*); Bowlby, Troutman & Jeffries, 1988 (*Sea Otters in Washington: Distribution, abundance, and activity patterns*); Butts, 1988 (*Management of the marine and ocean resources of the Washington coast: An interim report to the Washington State Legislature*); Hershman, Fluarty & Powell, 1988 (*State and local influence over offshore oil decisions (Washington State and Offshore Oil & Gas Series)*); Ocean Resources Assessment Program Advisory Committee, 1988 (*Information priorities: Final report of the Advisory Committee, Ocean Resources Assessment Program (Washington State and Offshore Oil & Gas Series)*); Strickland & Chasan, 1989 (*Coastal Washington: A synthesis of information (Washington State and Offshore Oil & Gas Series)*).

Renewable Resources There are a multitude of ocean resources that are important to Washington State. The major fishery resources caught in Washington's offshore coastal waters include salmon (silver and chinook), bottom fish (halibut, rock fish, cod, sablefish, flatfish, and whiting), and several types of shellfish (crab, shrimp, razor clam, and oysters). Sport salmon fishing is an

important component of Washington's coastal economy. Tribal fishers rely heavily on salmon for consumption, sales, and traditional cultural and religious values.

The most abundant marine mammal found in the coastal waters and estuaries is the harbor seal. Two types of sea lions are found off our coast: California sea lions and northern sea lions. There are approximately 100 sea otters off the coast (maybe less since the *Tenyo Maru* oil spill). Washington's coastal waters are a major migratory route for California gray whales, and are home to killer whales, porpoises, and dolphins.

The rocky headlands on the north coast provide breeding habitat for over 100,000 pairs of auklets, murrelets, tufted puffins, petrels, and other seabirds. Bald eagles, marbled murrelets, and peregrine falcons also nest along the coast. In Willapa Bay, up to 11,000 black brant are present in the bay at any one time, and up to 100,000 other waterfowl spend the winter in the Bay. Bowerman Basin, which is a shallow tidal area west of Hoquiam, supports up to a million migrating shorebirds in the spring and fall. The offshore waters seasonally support up to a million migrating birds, and are a major wintering area for sea ducks. In addition, these waters provide a year-round residence for a large variety of seabirds.

Coastal state park attendance and beach usage has climbed from 5 million visits in 1970 to 11.5 million in 1987.

Nonrenewable Resources Large offshore deposits of gravel are found from Cape Flattery to Grays Harbor. These deposits exist primarily in federal waters beyond the State's three-mile limit, and are clustered around the entrance to the Strait of Juan de Fuca, at the mouths of the Hoh and Quinault Rivers, and at the entrance to Grays Harbor.

To date, there has been no hard-rock mineral production offshore Washington. However, titaniferous sands and gravel resources, also known as "black sands," have been identified at several locations on the southern coast. The desire to explore the Cape Disappointment black sands has resulted in a lengthy leasing, permit, and exploration history involving an assortment of companies and individuals.

Washington's offshore waters have been used as a disposal area for low-level radioactive wastes, obsolete munitions, and industrial and municipal wastes, and are currently used for the disposal of dredge material.

Although much is known about many of our ocean resources, there is still much to be learned about what and how much is out there.

Current and Probable Ocean Uses

In assessing Washington's ocean program, one must keep in mind that NOAA is proposing a Marine Sanctuary off Washington's outer coast which would encompass the Northwestern coastal waters. The State's position is that no oil or gas development should be allowed in the Sanctuary and that other uses must be restricted or heavily regulated (this does not include fishing).

Renewable Resources Currently, the major ocean uses are commercial and recreational fishing and shellfish harvesting, and coastal and international shipping. For the most part, coastal shipping traverses the coast north-south, while international shipping transects the coast east-west with major entry points at the Strait of Juan de Fuca, Grays Harbor, and the Columbia River estuary. Washington's economy relies heavily on these uses.

Nonrenewable Resources There is no oil or gas exploration or development off our shore and will not be until a series of environmental studies are conducted by the Minerals Management Service. Oil and/or gas development can only occur if it can be shown that such development can take place in an environmentally sound manner.

There is no mineral or gravel extraction taking place off Washington's coast.

Conflicts

The primary conflicts probably occur between tugs and barges and crab fishers since they both operate nearshore in the same area. Barges can destroy or drag crab pot buoys. Expected conflicts would be those between seismic survey vessels and crab pots and oil and gas development platforms and fishing vessels. Additionally, oil and gas development can interfere with aesthetic uses of the ocean.

The most serious use conflict is between environmentally-damaging ocean uses and the need to protect our valuable, sensitive marine resources. Washington is dependent on its ocean waters to provide habitat and breeding areas for fish, birds, and mammals. The struggle will be to protect these renewable resources while allowing some non-renewable resource extraction.

In the context of oil and gas development, Washington evaluated the Shoreline Management Act (SMA), the Coastal Zone Management Act (CZMA) and their accompanying regulations to determine the State's preparedness to deal with the federal oil and gas leasing program. A result of the evaluation was the passage of the Ocean Resources Management Act which articulated a priority for renewable over non-renewable resources. The Act directed the Department of Ecology to develop "Ocean Use Guidelines" for the coastal counties to adopt into their shoreline master programs. Such guidelines have been written and are currently being incorporated into the counties' programs.

Conclusions and Needed Improvements

Washington State does not have a comprehensive ocean management program. As stated above, Ecology has one ocean policy coordinator primarily responsible for dealing with the Interior and Commerce Departments' federal programs. In responding to those programs, the coordinator communicates with staff in other state and federal agencies, as well as with local and tribal governments in developing the state's position.

Before Washington can develop a comprehensive ocean management plan, many pre-planning steps must be accomplished. The need and purpose for such a plan must be assessed, evaluated, and defined. This means brainstorming and strategizing within Ecology and then intense, detailed discussions with other agencies, the Governor's office, local and tribal governments, and the public.

From a scientific standpoint, much yet needs to be done despite the catalog of studies completed to date. There is still a paucity of information regarding many aspects of Washington's coastal and offshore waters, and the resources in those areas. In order to develop a scientific studies plan, we first need to assess what's been done, what's being done, and what should be done.

Next, Washington needs to take a look at where the state is with respect to ocean policy and where we want to be. The implications of the Olympic Coast National Marine Sanctuary must be considered, the scope of which is not yet determined.

Strategies

No strategies have yet been developed.

Siting Of Energy And Government Facilities

8) *Adoption of procedures and enforceable policies to help facilitate the siting of energy facilities and Government facilities and energy-related activities and Government activities which may be of greater than local significance.*

Bonnie Shorin

Assessment

Assess existing planning and regulatory procedures and policies which affect the siting of subject facilities and activities.

- *Evaluate the adequacy of existing state and local planning processes to address facility siting needs of greater than local significance.*
- *Examine the roles played by interested and affected public and private parties during the planning process.*
- *Evaluate enforceable policies, authorities and techniques used in managing and regulating energy-related and government facilities/activities and their impacts.*
- *Evaluate existing project review and permitting procedures to minimize duplication and enhance communication between permitting authorities and those requesting permits.*

This assessment reviews and summarizes the current state Energy Facility Site Evaluation Council (EFSEC) process and institutional arrangements as well as other inter- and intra-agency coordination functions. Consultation was made with the State Energy Office and the Energy Facility Site Evaluation Council.

Existing State and Local Planning Processes

There are no specific state or local planning processes especially devoted to the siting of energy or government facilities in the coastal zone.

Existing Policies, Authorities, and Project Review and Permitting Processes

Processes for energy facilities and government facilities are reviewed separately. Washington has a comprehensive process for addressing energy facility licensing; government facility licensing is subject to various processes depending on the nature of the project and the jurisdictions involved.

Energy Facilities One of the enforceable policies of Washington's approved Coastal Zone Management Program is Chapter 80.50 RCW, which established the Energy Facility Site Evaluation Council (EFSEC), and which requires energy facilities, other than hydropower facilities, be certified by the Council before they may be constructed. The 13 member council includes a representative from each of the following state agencies: Agriculture; Community Development; Ecology; Fisheries; Health; Natural Resources; Trade and Economic Development; Transportation; Wildlife; Office of Financial Management; Parks and Recreation Commission; State Energy Office; Utilities and Transportation Commission.

The Council's function is to consider and balance all costs and benefits of a proposed energy facility in a one-stop process, eliminating the need for a proposed project to receive multiple

permits, and avoiding duplicative review from the various agencies. This single process has streamlined siting for energy related activities by limiting site evaluation to two or three steps:

- The Council's Site Certification process may include an optional Preliminary Site Study before a formal application is submitted. The Potential Site Study is carried out by independent consultants hired by, and which report to, EFSEC.
- A formal Project Application is submitted to EFSEC by the applicant which, at the applicants' request, can receive standard or expedited processing. EFSEC regulations specify more than 50 specific issues that the applicant must investigate in preparing the application.
- Following the application, several documents and studies are prepared for Project Review. These documents, along with the Project Application, are reviewed by EFSEC's independent consultants, who submit their findings to EFSEC.
- EFSEC members study the record created in the Project Application and Project Review process, and weigh the evidence, then recommend to the Governor whether to approve or deny the project application.

When a project is recommended for approval, a Site Certification Agreement is issued which includes a list of terms and conditions required for safe construction and project operation, and to minimize adverse impacts. EFSEC is authorized to monitor facility operations and to enforce compliance.

Government Facilities The siting of government facilities and of hydropower facilities proceeds under the remaining elements of the Washington Coastal Zone Program. The enforceable policies applicable to siting of government facilities and other activities taking place in Washington's Coastal Zone include:

The Shoreline Management Act (SMA) - Chapter 90.58 RCW, the implementing regulations, and approved Shoreline Master Programs;

The Ocean Resources Management Act (ORMA) - Chapter 43.143 RCW;

The State Environmental Policy Act (SEPA) - Chapter 43.21C RCW, and the implementing regulations;

The Financial Responsibility and Transport of Petroleum Products Act - Chapter 88.40 RCW;

Federal and State Water Pollution Control Acts, and their implementing regulations (State Clean Water Act is found at Chapter 90.48 RCW);

Federal and State Clean Air Acts and their implementing regulations (State Clean Air Act is found at Chapter 70.94 RCW).

Public Participation Process

EFSEC Public participation is available at all stages of the EFSEC decision making process. If the Preliminary Site Study option is exercised, public meetings are held in the communities near the proposed project site to provide information to residents and to hear concerns and opinions about the proposal. A series of hearings takes place when the applicant files a formal application with EFSEC, including public hearings and formal adjudicative hearings which are open to the

public. Information gathered during the hearing process is also considered by the Council in decision making. Additional opportunity for public comment occurs during the State Environmental Policy Act review process, when Draft and Final Environmental Impact Statements are prepared.

SMA and Other CZMP Enforceable Policies Siting under these provisions may require that the applicant receive several state permits. Permitting decisions made by State authorities will trigger review under the State Environmental Policy Act, which creates the opportunity for public participation. Additionally, the Shoreline Management Act, which is considered the heart of the Coastal Zone Management Program, is designed to allow participation in the permitting process by affected parties and interested members of the public. This is achieved through public noticed and a comment period prior to the issuance of a shoreline permit for substantial developments taking place within shoreline jurisdiction, a public hearing on the issuance of the permit, if deemed appropriate, as well as a thirty day right of an aggrieved party or member of the public to appeal to the Shorelines Hearings Board following the Department of Ecology's decision to approve a shoreline permit.

Current Issues

No major application has been before the EFSEC for some years. During 1991, the Trans Mountain Pipeline Company initiated preliminary licensing application procedures for an offshore oil terminal in Clallam County with a associated pipeline which would run east through Clallam and Jefferson counties, cross Puget Sound to Island County, and then run north through Skagit County to its terminus in Whatcom County. EFSEC conducted a series of community awareness workshops in early December 1991. Trans Mountain is expected to make formal application in spring 1992.

Conclusions and Needed Improvements

At this stage, evaluation of existing planning and regulatory procedures which affect the siting of government and energy facilities reveals the following:

- Adequacy of existing state and local planning processes to address siting needs of greater than local significance.

EFSEC The EFSEC process has been considered the primary means by which the state can legally enforce the commitment to consider national interests in the siting of energy facilities in the coastal zone. Given the extensive checks and balances of the EFSEC process, the ability of federal agencies to intervene in EFSEC proceedings, and the preemptive powers of EFSEC, EFSEC has been deemed able to provide a formal, balanced, and objective means of adequately considering siting needs of greater than local interest. However, some suggestions have been raised toward improving communication and consideration of greater than local concern. These include formalizing tribal involvement by possibly including a council seat for tribal government, and by creating a formal method for discussion of energy siting issues common to other states and of interest to federal agencies.

SMA The Shoreline Management Act, the most substantive portion of general application within the CZMP, is the primarily vehicle available to insure adequate consideration of any possible national interests in the siting of government facilities and energy facilities not within EFSEC's purview, such as hydroelectric facilities. The SMA provides several

ways to ensure that the state program neither arbitrarily excludes nor unreasonably restricts the siting of facilities of greater than local interest. These include the open planning process established in the shoreline program, the appeals process available through the Shorelines Hearings Board, and the statutory recognition of the statewide interest over local interest with respect to shorelines of statewide significance.

- Roles played by interested and affected public and private parties during the planning process.

EFSEC As described above, the EFSEC planning process allows extensive opportunity for public participation. As well as the thirteen members of the council which represent state agencies, when a site certification is requested, a representative of the affected local jurisdiction will have a place among the council in order to address issues of local planning requirements, local ordinances, and local concerns. Since EFSEC's creation in 1975, the Site Evaluation Council has found occasions to grant, as well as deny, site certifications.

While the EFSEC process as a whole has generally been shown to adequately accommodate the concerns of both public and private parties who would be affected in the siting of major energy facilities, there has been a perception among affected local jurisdictions that the process is too heavily weighted toward state concerns. A suggested improvement may be to add citizen appointees to the council, in addition to the citizen council chair.

SMA Similarly, the public participation allowed by Shoreline Management Act, as described above, has been proven to create appropriate avenues for the expression and consideration of concerns by public and private parties. An appeal to the Shorelines Hearings Board may be made by affected neighboring owners aggrieved by the decision to allow a substantial development, by members of the public who are concerned that permitting the development may contradict either the provisions of the shoreline master program or the Shoreline Management Act, or by the applicant for the permit who believes that the denial of the permit or the placement of conditions on the permit is unwarranted.

- Methods to minimize duplication and enhance communication between permitting authorities and those requesting permits.

EFSEC The purpose behind the passage of Chapter 80.59. RCW, which created EFSEC, was to create a special mechanism and a streamlined process for those energy facilities which existing criteria were considered unable to handle. Since EFSEC has been in effect, the Council has handled applications for or had formal input on several types of energy facilities, including nuclear power plants, major oil pipelines, major electricity transmission lines, and a coal fire plant.

All of these siting decisions were made under the general criteria and operations of the EFSEC process. EFSEC is considered very effective in eliminating duplication and centralizing communication between the applicants and the permitting authorities, when compared to pre-EFSEC processing. However, it has been suggested that the development of some separate criteria or procedures specifically to handle these various types of energy facilities could prove beneficial in improving the processing of siting requests. Such modifications would avoid the current, somewhat "ponderous" methods which apply uniformly to encompass all types of energy facilities.

SMA While the variety of government facilities that could be placed in the coastal zone may trigger a number of local permitting requirements, the Coastal Zone enforceable policies which government facilities are most likely to trigger are Shoreline Management Act, SEPA, and the Clean Water Act. The Shoreline Management Act is functions as a local government/state government cooperative effort, with Ecology as the state implementing agency. SEPA processes are accordingly engaged in by the local government in the issuance of shoreline and other permits. Therefore coordination and communication between the applicant and the permitting agency is centralized with the local government at the first stage of permit decision-making. Ecology has oversight functions regarding shoreline permitting, and has authority to implement the state's Clean Water Act, although these two functions are carried out by separate programs within the agency.

The various levels of permitting and review, plus the differing time frames involved, may be frustrating to the applicant. A possible method for improvement could be to prepare a small document outlining for applicants the time frames for various permit processes, the levels of government with authority over these permits, and a suggested sequence of application for permits in order to avoid delays in meeting each of the required enforceable policies.

- Effectiveness of enforceable policies, authorities and techniques used in managing and regulating energy-related and government facilities/activities and their impacts.

EFSEC The Siting Council has authority over power plants producing 250 megawatts or over. While the Council has sited several plants under this threshold, many large power plants which raise issues of the same nature as a 250 megawatt plant have escaped the Council's purview by falling short of the 250 megawatt threshold. Along these lines, EFSEC has authority over large oil refinery expansions, but many oil refineries have bypassed EFSEC's review by making several sizable expansions over a period of years, each expansion falling short of the level which would trigger EFSEC review. The result has been a cumulative increase well over EFSEC's threshold for authority, but individually avoiding review.

In order to enhance the Council's ability to manage and regulate energy related facilities and activities, it has been suggested that the enabling legislation be amended to lower the 250 megawatt threshold, and to allow some ability to address cumulative increases and the effects thereof. Similarly, EFSEC does not have authority over power facilities using renewable sources of energy, regardless of the size of the facility. It may be appropriate to expand the Council authority to include larger scale renewable source energy facilities.

Strategies

No draft strategies have yet been adopted.

4 • Strategies

Introduction and Summary

Washington has chosen to propose Section 309 improvement strategies in the following areas.

Washington's Shorelands and Coastal Zone Management Program, along with other state agencies, is presently subjected to severe budget problems with no likelihood of relief in the near future. Washington's budget problems are caused by the national recession. Typically, national recessions spread to the Pacific Northwest after they have peaked on the East Coast, and linger in the Northwest after recovery has begun elsewhere.

Wetlands Strategy

Consistent with Department of Ecology Strategic Plan goals to achieve economic efficiencies, our Wetlands Strategy has been integrated into our broader Growth Management Strategy. While the Wetlands Strategy could be broken out as a separate Section 309 project, we have tentatively chosen this approach because the wetlands strategy is consistent with, and integral to our broader growth management strategy. This strategy utilizes the comprehensive planning mandate of Washington's new Growth Management Act (GMA) and the adjacent lands consistency requirement of the Shoreline Management Act (SMA) to achieve the Section 309 objectives.

Please refer to page 20 for the integrated Growth Management Strategy.

Coastal Erosion Management Strategy

Coastal erosion management is both a present day policy issue and a concern for the future. Shoreline erosion (and related bluff landsliding) is a problem within Puget Sound where erosion and landsliding poses a threat to residences and appurtenant structures. Traditional approaches to erosion management have focused on shoreline armoring, producing a concern over the long term cumulative effect on shoreline resources. (Note: the terms shoreline armoring and shoreline hardening are synonymous in this report.) Little emphasis has been placed on institutional or nonstructural approaches such as setbacks. Finally, there is a potential for accelerated coastal erosion due to accelerated sea level rise, and an increased demand for shoreline armoring by shoreline property owners. Detailed assessment of the issue may be found in Volume 1, Final Assessment under both the Coastal Hazard Areas (Geologic Hazards and Sea Level Rise) and Cumulative and Secondary Effects of Growth sections. In brief, the concern is that wide spread shoreline armoring will reduce sediment input to shoreline systems, thus starving beaches of the necessary fine materials, leading to a transformation of sand beaches to cobble beaches, inducing aggravated shoreline and beach erosion, and habitat degradation. The proposed strategy provides an integrated means of reducing the threat of coastal hazards due to erosion and landsliding, while limiting inappropriate erosion control structures or their cumulative and secondary effects.

Problem Summary

The proliferation of new residential construction along Puget Sound shorelines in recent years has lead to an increased incidence of shoreline armoring. No quantitative information about the rate and character of the shoreline armoring has yet been developed. Concern has grown about the cumulative impacts of marine shoreline armoring on both the physical processes and biologic

functions of the shoreline. The Shorelands and Coastal Zone Management Program has had an ongoing program in this area to address the effects of shoreline hardening (Terich & Schwartz, 1990) and alternatives to shoreline armoring (Terich, Schwartz & Johannessen, 1991a, 1991b) as well as erosion management techniques (Canning, 1991a, 1991b). A CZMA Section 306 project to evaluate the rate and character of shoreline armoring in Thurston County was scheduled to be completed by June 1992, but had to be cancelled due to a Washington state budget short fall.

The level of concern is such that the County Commissioners of Thurston and Mason counties and the Pierce County Executive requested that the Washington Department of Ecology to prepare a programmatic environmental impact statement on the cumulative effects of bulkheading. There is also growing interest on the part of shoreline property owners in alternatives to bulkheading: sloped rock revetments, beach nourishment (feeding), and vegetative methods of shore protection. The adverse effects of large scale shoreline hardening are discussed in the Cumulative and Secondary Effects of Growth section, Volume 1, Final Assessment.

The construction of erosion protection structures is regulated under local Shoreline Master Programs (established and approved under the state Shoreline Management Act), by local construction codes, and by the Department of Fisheries' Hydraulics Project Approval (HPA) permit. However, the Shoreline Management Act exempts single-family residences from the regular permit process for shoreline developments. Because such a large percentage of the shoreline is zoned for single-family residential use, the proliferation of hardened shoreline will likely continue without better documentation of the consequences or better information about alternatives. In the near future, Growth Management Act requirements for special consideration of critical areas (including erosion prone areas) may provide additional protection if adequate guidance is available to local governments for adoption of local ordinances and plans. The principal means of addressing erosion management in Washington state has been through construction works, either structural (bulkheading, rip rap, etc.) or nonstructural (e.g. beach nourishment). Some local Shoreline Master Programs address nonstructural institutional approaches (e.g. setbacks) but usually only with respect to bluff landsliding (Canning, 1991b).

The 1992 Washington Legislature has adopted an amendment (ESB 6128) to the Shoreline Management Act which adds the following to RCW 90.58.100:

Each master program shall contain standards governing the protection of single family residences and appurtenant structures against damage or loss due to shoreline erosion. The standards shall govern the issuance of substantial development permits for shoreline protection, including structural methods such as construction of bulkheads, and non-structural methods of protection. The standards shall provide for methods which achieve effective and timely protection against loss or damage to single family residences and appurtenant structures due to shoreline erosion. The standards shall provide a preference for permit issuance for measures to protect single family residences occupied prior to January 1, 1992, where the proposed measure is designed to minimize harm to the shoreline natural environment. (Conference Committee Report, March 9, 1992.)

This amendment gives clear instructions to local government to adopt new or amended erosion management elements in their Shoreline Master Programs. This amendment sets a clear cut off (January 1, 1992) after which protection of occupied residences do not have a preference for erosion protection. This amendment also clearly indicates that erosion protection measures must be designed to minimize harm to the environment.

In summary, there are two problems to be addressed. Erosion protection for existing structures must be addressed, including mitigation and minimization of the adverse effects of shoreline armoring. Erosion hazard management for new construction and new developments should include nonstructural approaches such as setbacks.

Proposed Program Changes

In summary, model elements for local Shoreline Master Programs will be developed which will address the two fundamental issues, erosion management for existing structures with minimum adverse effects, and coastal erosion hazard management for new construction. These model Master Program elements must be backed by thorough research which will serve as the “findings of fact” necessary for local government to adopt Master Program amendments, and as a means of identifying the most environmentally benign structural alternatives. Once adopted by local government and approved by Ecology, local Shoreline Master Programs amendments are incorporated into Washington’s Coastal Zone Management Program through the normal CZMP amendment process.

Under Washington’s Shoreline Management Act (SMA) local governments are required to adopt and implement local Shoreline Master Programs. The state (through the Washington Department of Ecology) retains oversight over local SMPs to assure consistency with over riding statewide interests. Local SMPs, after local adoption and state approval, are incorporated into the state SMP as a Washington Administrative Code amendment. Finally, approved local SMP amendments are incorporated into Washington’s Coastal Zone Management Program.

Description The research reports which will serve local government as “findings of fact” will be published as stand-alone reports as they are completed, and as technical appendices to a comprehensive summary report which will take the form of a programmatic environmental impact statement. (In Washington state environmental analysis jargon, a project EIS analyzes a specific development project, while a programmatic EIS analyzes a government action such as adoption of a comprehensive plan.) As each research report is completed, “information transfer” papers will be prepared for local government planners, along with public information brochures. These technology transfer and information transfer products will be produced as Section 306 grant tasks.

The programmatic EIS will address alternatives to the present permitting procedures and typical regulations covering coastal erosion. These alternatives will form the basis for model Master Program elements which will be published as addenda to the *Shoreline Management Guidebook*. The programmatic EIS can also serve as the basis for local government supplemental EISs on Shoreline Master Program amendments, further assisting the local SMP amendment process.

Anticipated Effect Timely completion of this strategy will enable local governments to more easily amend their Shoreline Master Programs regarding shoreline erosion management and the permitting process for erosion control. The technical studies will enable better, more informed decisions to be made by local government staff and administrators.

Program Change Rationale

No other program change approach is viable. ESB 6128 directs local governments to amend their Shoreline Master Programs.

Work Plan Schedule

Ecology proposes to carry out a study on the cumulative effects of marine shoreline hardening on the physical and living environment, including assessment of alternative erosion control practices, regulatory systems, and permitting programs. The final integrated study report will be presented as a programmatic environmental impact statement. The study would entail seeking answers to the following essential questions:

- 1. *What is the extent, rate, and character of recent shoreline armoring?*** No quantitative data exists, only professional observations and opinions. During FY 1991 it was planned to carrying out an inventory and characterization of representative Thurston County shoreline armoring, but budget cuts caused the project to be cancelled. The answer to this question will enable a quantitative discussion on the extent and nature of shoreline armoring over the past 15 years and how that shoreline hardening has correlated with land use types and densities. In brief, it will quantitatively demonstrate the severity of the issue of shoreline armoring. Fiscal year 1992; \$47,000.
- 2. *What are the appropriate engineering and geotechnical standards for shoreline erosion management under different energy regimes and what are the relative costs?*** The study must address coastal erosion management alternatives. Impacts would be addressed separately; this task would assess the engineering viability, longevity, and relative cost of selected alternatives (bulkheading, rip rap, beach nourishment, no action, etc.). This task would build upon the work of the US Army Corps of Engineers' nationwide study (Moffatt & Nichol, 1981), and particularly the demonstration project carried out in Puget Sound at Whidbey Naval Air Station. This task will provide the basis for local government enactment of clear standards for appropriate erosion management measures. Fiscal year 1992; \$23,000.
- 3. *What are the cumulative effects of shoreline armoring on physical coastal processes?*** In recent years we have addressed this question at a low level of detail through the annotated bibliographies prepared by Western Washington University, but these reports lack the needed interpretive element. The preparation of a comprehensive technical report on the direct, secondary, and cumulative effects of shoreline erosion control alternatives (bulkheading, rip rap, beach nourishment, no action) on physical coastal processes is proposed. Fiscal year 1992; \$55,000.
- 4. *What are the existing regulatory approaches in common use and what are their relative strengths and weaknesses?*** The SMA provides a framework within which local governments adopt local Shoreline Master Programs attuned to local conditions. Permit applicants must also comply with the requirements of the Department of Fisheries' HPA and the US Army Corps of Engineers' Department of the Army Permit (Clean Water Act Section 404). This task would summarize, compare, contrast, and evaluate existing approaches to shoreline erosion management and regulation, including identification of the relative number of permit applications which are denied or conditionally approved subject to mitigation. Both western Washington approaches and other regions (e.g. Chesapeake Bay, Oregon, and North Carolina) will be considered. This task shall be designed to address: shoreside techniques (structural and nonstructural construction approaches) and landside techniques (setbacks, relocation, etc.); new construction and existing facilities; and shoreline erosion and bluff landsliding. Fiscal year 1995; \$35,000.
- 5. *What are the secondary effects of shoreline armoring physical effects on ecological systems?*** The answer to this question must follow up on the answer to the question posed in task

3. The preparation of a comprehensive technical report on the direct, secondary, and cumulative effects of shoreline erosion control alternatives (bulkheading, rip rap, beach nourishment, no action) on intertidal, shallow subtidal, and near shore uplands habitat structure and function, biodiversity, and productivity is proposed. Habitats to be addressed will be based on “critical habitats” as defined by the Washington Department of Fisheries. Fiscal year 1993; \$30,000.

6. How can slope failure (landsliding) be best managed? A large measure of bulkheading is in reaction to slope failures, not shoreline erosion *per se*. Slope instability is caused by a combination of inherent geologic weaknesses, ground water loading, and toe erosion. This has been observed in many of the site inspections carried out by Shorelands staff. It is anticipated that a combination of construction setbacks, ground water management, and shoreline erosion management will be needed for a balanced approach. Fiscal year 1993; \$30,000.

7. Are there viable alternatives to managing shorelines on a case-by-case basis? Traditionally, shoreline management and erosion control permitting has been on a case-by-case basis, and there is a large measure of institutional inertia supporting this approach. In addition to alternatives to structural and nonstructural methods, the study must address alternative management schemes such as evaluation of permit applications in the context of whole littoral cells. This task will address both the technical and political feasibility of management on a drift cell basis. Fiscal year 1994; \$20,000

8. Study program integration: Programmatic Environmental Impact Statement. This task will integrate the special study reports into a programmatic draft environmental impact statement; following standard public review procedures a final EIS will be issued. The EIS Alternatives Section will include structural and nonstructural approaches, plus institutional alternatives. Fiscal year 1995; \$18,260. (Note: Cost is based on a 0.5 FTE level of effort over a total of six months. The FTE is a blending of senior and support professional staff plus clerical support.

9. What are the alternative Shoreline Master Program model elements? Based on the foregoing findings of fact, and EIS process, this task will formulate specific model elements which can be recommended as amendments to local Shoreline Master Programs. The foregoing summary and specific reports can serve as legal findings of fact on which local governments can base their adoption of Master Program amendments. Fiscal year 1995; \$20,000.

The work plan schedule is summarized in Table 1: Erosion Management Strategy Work Schedule Summary

Federal Fiscal Year	Technical Studies	Policy Studies	Interim Products
1992 ¹	1. Shoreline armoring inventory and characterization 2. Engineering standards and costs for shoreline erosion management. 3. Physical effects of shoreline armoring.	4. Alternative regulatory approaches.	Public information brochures on the Erosion Management Strategy project.
1993 ¹	5. Ecological effects of shoreline armoring. 6. Engineering standards for coastal slope stabilization.	7. Evaluation on management by drift cells.	Draft guidance on alternative regulatory approaches. Information and technology transfer papers and brochures on FY 1992 technical reports.
1994 ¹	8. Programmatic Environmental Impact Statement.	9. Shoreline Master Program model elements.	Information and technology transfer papers and brochures on FY 1992 technical reports.

Note 1. Task 10, convening the Coastal Erosion Advisory Committee, is an on-going task throughout the project.

Cost Estimate Summary

Total program costs are estimated to be a minimum of \$335,260 over a three year period as summarized in Table 2: Erosion Management Cost Estimate Summary.

Task	Salaries & Benefits	Travel	Supplies	Indirect	Grants and Contracts	TOTAL
1. Shoreline armoring inventory and characterization					\$47,000	\$47,000
2. Engineering standards					\$23,000	\$23,000
3. Effects on physical processes					\$55,000	\$55,000
4. Alternative regulatory approaches					\$35,000	\$35,000
5. Effects on ecological systems					\$30,000	\$30,000
6. Standards for slope stabilization					\$30,000	\$30,000
7. Management by drift cell					\$20,000	\$20,000
8. Programmatic EIS	\$ 12,000	\$ 540	\$ 1,015	\$4,705		\$18,260
9. SMP model elements					\$20,000	\$20,000
10. Coastal Erosion Advisory Committee ¹	\$36,460	\$1,690	\$3,170	\$14,680		\$57,000
TOTAL						\$335,260

Note 1. Task 10, Convening a Coastal Erosion Advisory Committee, will be on-going throughout the duration of the Erosion Management Project. Costs cited are based on 0.25 FTE/year for the

entire three years. The FTE is a blending of senior and support professional staff plus clerical support.

It is important to understand how the costs associated with each task were arrived at. Each task could be carried out at an infinitely variable level-of-detail. Just as there is a level-of-detail, and an associated cost, below which the product would be useless, there is also an upper threshold beyond which a greater level-of-detail (and an associated cost) would fail to buy anything of additional value. Based on prior experience of contracting for technical and policy studies, we have identified the level-of-detail deemed appropriate for each task and reflected this judgement in its associated cost. Prospective contractors will be competing based on what they are willing to provide for the money available, as well as on their qualifications. This approach has successfully worked for us in the past.

Success Assessment

ESB 6128 requires local governments to amend their Shoreline Master Programs. As noted above, this amendment to the SMA gives clear instructions to local government to adopt new or amended erosion management elements in their Shoreline Master Programs. This amendment sets a clear cut off (January 1, 1992) after which protection of occupied residences do not have a preference for erosion protection. This amendment also clearly indicates that erosion protection measures must be designed to minimize harm to the environment.

Three key coastal counties (Thurston, Mason, and Pierce) have shown evidence of being predisposed to amend their Shoreline Master Programs by virtue of their request for a programmatic EIS on the cumulative effects of shoreline armoring. In recent years King and Island counties have been denying some applications for erosion control structures, again indicating a predisposition towards strengthening their Shoreline Master Programs.

To enhance the likelihood of success, Ecology will convene a Coastal Erosion Advisory Committee (CEAC). The role of the CEAC will be to assist Ecology in formulating the fine details of study tasks, interviewing prospective contractors, and reviewing draft reports. The function of the CEAC will be to achieve broad based support for the goals of the over all Coastal Erosion Management Project. The composition of the CEAC will include coastal resource managers, local government planners, representatives of Native American governments, coastal engineers and geologists, coastal property owners, erosion control contractors, and coastal public interest organizations. The CEAC will be an on-going task (Task 10) throughout the duration of the project.

Anticipated Support Political support is already indicated by Thurston, Mason, and Pierce counties. It is not anticipated that direct fiscal support would be provided by these local governments due to budget constraints, but at least nominal staff support is anticipated.

Proposed State Action The Department of Ecology will provide overall program management and will prepare the programmatic EIS. Ecology's Shorelands Program will be responsible for substantive EIS matters, and Ecology's Central Programs would be responsible for EIS procedural matters.

Fiscal Year 1993 Work Program

During State Fiscal Year 1993 (July 1, 1992 to June 30, 1993) it is proposed to carry out five tasks: Task 1: Shoreline Armoring Inventory and Characterization; Task 2: Engineering

Standards and Coasts for Shoreline Erosion Management; Task 3: Effects of Shoreline Hardening on Physical Shoreline Processes; Task 4: Alternative Regulatory Approaches; and Task 10: Coastal Erosion Advisory Committee. The total costs for FY 1992 are \$179,000.

Task 1: Shoreline Armoring Inventory and Characterization

The state Shoreline Management Act (SMA) allows owners of a single family residence to obtain a shoreline substantial development permit exemption for bulkheads on coastal waters. In 1990 alone, Thurston County processed over 100 bulkhead exemptions affecting 1 to 2 miles of shoreline, or approximately 1-1/4% of the County's marine shorelines.

This proposed task is for the inventory and characterization of shoreline armoring (bulkheads, rip rap, etc.) in Thurston County. Thurston County was chosen as the object of this task for cost effectiveness purposes as well as

The approach will be to establish a baseline condition in 1977 based on interpretation of available aerial oblique photography. The current situation will be based on interpretation of new aerial oblique photographs (to be acquired in the current state FY 1991). Field checking of the interpretation of the current photography will provide a quality assurance and quality control measure over the interpretation of the 1977 photography.

Description This task is divided into the following subtasks. (Note: An abnormally high level of detail is available to describe this task because a scope of work was nearly completed in Federal FY 1991 for a Section 306 project.)

1. Project management, subcontractor supervision, and monthly reporting.
2. Collect baseline information on the current character and conditions of the study area marine shorelines based on available documentation and data summaries:
 - Shoreline Environment Designations (Thurston County)
 - Drift Cells (Department of Ecology)
 - Coastal Dynamics (Coastal Zone Atlas)
 - Slope Stability (Coastal Zone Atlas)
 - Generalized Land Use (Thurston County)
 - Critical Biological Habitat (Department of Fisheries)

Critical biological habitat information available from the Department of Fisheries includes Sand Lance, Rock Sole, and Pacific Herring spawning areas; Eel Grass beds; and some shellfish species.

3. Digitize the information gathered under Subtask 2, using Thurston County Assessor's maps as base maps. (Note: Thurston Regional Planning already has an operational GIS; no money will be expended in developing a GIS. Any references to GIS tasks are for the utilization of this system in compiling and reporting data.)

4. Acquire Mylar copies of the Assessor's tax parcel maps (1 = 400) and paper copies of the Thurston County orthophoto maps (1 = 400) for the years 1973, 1977, 1983, and 1989 for the field reconnaissance team.

5. Compile and digitize into the mapping system bulkhead permits and exemptions from Thurston County and the City of Olympia from 1977 to the present. Identify the Assessor's parcel number, water body, length of bulkhead, year permitted, and if it is a new or replacement structure. Review permit files of the Washington Department of Fisheries (Hydraulic Project Approval) and the US Army Corps of Engineers Seattle District Office (Section 404 Clean Water Act) for duplicate or orphan permits which were issued by only one jurisdiction.
6. Inventory and compile onto working maps the extent and type of shoreline armoring in 1977 and 1992 based on interpretation of aerial oblique photography.
7. Conduct a field reconnaissance of selected segments of shoreline to provide quality assurance and quality control over the photo interpretation. This activity to be conducted primarily by boat to avoid the necessity of obtaining trespass permission.
8. Based on Subtask 6, correct the working maps (Subtask 5) and digitize this information into the mapping system
9. Prepare draft report of findings which shall report on the extent and character of shoreline armoring in 1977 and 1992, quantitatively describe the trends, associate the trends with land use patterns, and provide recommendations for future actions.
10. Submit the draft report to Ecology and the Coastal Erosion Advisory Committee (CEAC).
11. Prepare a final report which integrates the comments of the CEAC and provide Ecology with camera ready copy and files on disk in a mutually agreeable file format.

Relationship to Assessment This task will document the extent and nature of shoreline armoring by providing a quantitative inventory and characterization of the rate and nature of shoreline armoring of a representative portion of the Puget Sound shorelines.

Schedule and Benchmarks This task is proposed to be completed within one year on the following schedule.

- Task 1: Initiate by August 1, 1992; project management ongoing throughout project.
- Tasks 2 - 5: Complete by February 26, 1993 and submit progress report.
- Task 6: Complete by April 15, 1993 and submit progress report.
- Tasks 7 - 9: Complete by May 15, 1993 and submit draft report.
- Task 10: Submit final report to Department of Ecology by June 15, 1993.

Approach This Task is proposed to be carried out by Thurston Regional Planning Council under contract to the Department of Ecology. Thurston Regional would subcontract portions of the task, specifically field reconnaissance and data development subtasks to an academic or nonprofit organization. Analysis and report production would be collaborative efforts. Thurston Regional would carry out computer mapping, digitization, and project management functions. The Washington Department of Fisheries would cooperate by providing access to unpublished critical habitat information.

Cost Estimate \$47,000.

Task 2: Engineering Standards and Costs for Shoreline Erosion Management

The vertical concrete bulkhead is the technique of choice for most shoreline armoring projects in the South Puget Sound region if only because this is the construction technique encouraged by most contractors. In central Puget Sound a mix of concrete bulkheading, vertical rock walls, and rock rip rap is used. In northern Puget Sound limited use is still made of wood bulkheads. Beach nourishment is seldom practiced in any region if only because it seems better suited to large scale projects rather than for most individual homesites. It is the purpose of this task to identify the range of energy regimes and geologic conditions particular erosion control practices are suited to, to identify best engineering and construction practices, and to provide a range of typical construction costs. This information will provide the basis for subsequent development of model Shoreline Master Program model elements.

Description This task is divided into the following subtasks.

1. Project mobilization, initial coordination with Ecology, and ongoing coordination and project management.
2. Identify the range of coastal energy regimes (wind and wave direction, wave height, seasonality, relative frequency, etc.) commonly encountered in the Puget Sound region.
3. Shoreline armoring—new construction
 - Concrete bulkheading
 - Vertical rock walls
 - Rock rip rap
 - Patent construction techniques
 - Gabions
4. Shoreline armoring—replacement projects
5. Beach nourishment
6. Vegetation management
7. Identify typical construction costs and the regional availability of qualified contractors and construction materials.
8. Prepare draft report.
9. Prepare final report.

Relationship to Assessment This task supports the overall program by providing a comprehensive review of the technical feasibility and economic costs of specific erosion control practices.

Schedule and Benchmarks This task is proposed to be completed within one year on the following schedule.

- | | |
|--------------|---|
| Task 1: | Initiate by August 1, 1992; project management ongoing throughout project. |
| Tasks 2 - 7: | Complete analysis of specific erosion management practices, including submittal of rough drafts, by February 15, 1993 |

Task 8: Submit draft report for review by Department of Ecology by April 15, 1993

Task 9: Submit final report to Department of Ecology by May 30, 1993.

Approach This task would be carried out under contract to the Department of Ecology by a firm, organization, or team with credentials in small scale coastal engineering, structural methods of erosion control, beach nourishment and other nonstructural erosion control, and construction cost estimating.

Cost Estimate \$23,000.

Task 3: Effects of Shoreline Hardening on Physical Shoreline Processes

A reconnaissance literature survey on the effects of shoreline armoring on physical shoreline processes has been completed for Ecology (Terich & Schwartz, 1990; Terich, Schwartz & Johannessen, 1991a, 1991b). Most of the available literature describes research projects on open ocean coastlines. A more thorough literature search is needed, along with an interpolation of the findings for Puget Sound conditions.

Description This task is divided into the following subtasks.

1. Project mobilization, initial coordination with Ecology, and ongoing coordination and project management.
2. Complete a comprehensive literature search covering peer review literature, inquiries to state and federal coastal management agencies, graduate theses and dissertations, and other sources as may be appropriate. This task shall build upon a reconnaissance literature survey completed by Western Washington University.
3. Prepare an annotated bibliography of all relevant materials discovered in task 2.
4. Prepare a comprehensive discussion which integrates the literature and interpolates the literature for Puget Sound energy regimes, sediment characteristics, and shoreline dynamics. This subtask should receive the major emphasis of the overall task.
5. Prepare draft report.
6. Prepare final report.

Relationship to Assessment This task provides the fundamental underpinning to a succeeding task which will address secondary effects on biological resources and ecological systems.

Schedule and Benchmarks This task is proposed to be completed within one year on the following schedule.

Task 1: Initiate by August 1, 1992; project management ongoing throughout project.

Tasks 2 & 3: Submit comprehensive progress report for review by Department of Ecology by December 31, 1992

Task 4: Submit rough draft for review by Department of Ecology by March 1, 1993

Task 5: Submit draft report for review by Department of Ecology by April 15, 1993

Task 6: Submit final report to Department of Ecology by May 30, 1993.

Approach This task would be carried out under contract to the Department of Ecology by a firm, organization, or team with credentials in coastal geology, coastal physical oceanography, coastal sediment transport, and coastal hydrodynamics, and which can demonstrate that they derive no substantial amount of income from the design or construction of coastal erosion protection structures or systems.

Cost Estimate \$55,000.

Task 4. Alternative Regulatory Approaches

The Shoreline Management Act provides a framework within which local governments adopt local Shoreline Master Programs attuned to local conditions. Permit applicants must also comply with the requirements of the Department of Fisheries' HPA and the US Army Corps of Engineers' Department of the Army Permit (Clean Water Act Section 404). This task would summarize, compare, contrast, and evaluate existing approaches to shoreline erosion management and regulation, including identification of the relative number of permit applications which are denied or conditionally approved subject to mitigation. Both western Washington approaches and other regions (e.g. Chesapeake Bay, Oregon, Great Lakes, and North Carolina) will be considered.

Description This task is designed to address: shoreside techniques (structural and nonstructural construction approaches) and landside techniques (setbacks, relocation, etc.); new construction and existing facilities; and shoreline erosion and bluff landsliding.

Task 1: Project mobilization, initial coordination with Ecology, and ongoing coordination and project management.

Task 2: Complete a compilation and description (in a case examples format) of representative shoreside regulatory techniques (structural and nonstructural construction approaches) for erosion management which addresses both new construction and existing facilities and both shoreline erosion and bluff landsliding.

Task 3: Complete a compilation and description (in a case examples format) of representative landside regulatory techniques (setbacks, relocation, etc.) for erosion management which addresses both new construction and existing facilities and both shoreline erosion and bluff landsliding.

Task 4: Prepare a comprehensive assessment of the relative strengths and weaknesses of the regulatory approaches compiled and described in the case examples subtasks (Subtasks 2 and 3).

Task 5: Prepare draft report.

Task 6: Prepare final report.

Relationship to Assessment Completion of this task is central to the fundamental goal of providing comprehensive model Shoreline Master Program element to address both shoreside

and landside regulation of erosion control activities and erosion hazard minimization. The results of this task will provide the basis for development of model SMP elements (Task 9).

Schedule and Benchmarks This task is proposed to be completed within one year on the following schedule.

- Task 1: Initiate by August 1, 1992; project management ongoing throughout the project.
- Tasks 2 & 3: Complete and submit comprehensive progress report to Ecology by December 31, 1992.
- Task 4: Complete and submit preliminary draft to Ecology by January 31, 1993.
- Task 5: Complete and submit to Ecology by March 15, 1993.
- Task 6: Complete and submit to Ecology by May 30, 1993.

Approach This task will be carried out under contract to the Department of Ecology by a firm, organization, or team with credentials in coastal zone management, erosion management, and policy analysis.

Cost Estimate \$35,000.

Task 10. Coastal Erosion Advisory Committee

To enhance the overall likelihood of success of the Erosion Management Project, Ecology will convene a Coastal Erosion Advisory Committee (CEAC). The role of the CEAC will be to assist Ecology in formulating the fine details of study tasks, interviewing prospective contractors, and reviewing draft reports. The underlying function of the CEAC will be to achieve broad based support for or acceptance of the goals of the over all Coastal Erosion Management Project.

Description The composition of the CEAC will include coastal resource managers, local government planners, representatives of Native American governments, coastal engineers and geologists, coastal property owners, erosion control contractors, and coastal public interest organizations. The CEAC will be an on-going task (Task 10) throughout the duration of the project.

Relationship to Assessment The Assessment identifies a number of organizations which affect or are affected by erosion management programs. The CEAC will provide a means of enrolling those various organizations in the Erosion Management Project, its process and its products. Tentative membership in the CEAC will include:

State Agencies

- Ecology, Washington Department of
- Natural Resources, Washington Department of
- Fisheries, Washington Department of

Native American Governments and Organizations

- Squaxin Island Tribe
- Northwest Indian Fisheries Commission

Local Government

Thurston Regional Planning Council
Mason County Planning Department
Island County Planning Department

Advocacy and Interest Groups

a representative erosion control contractor
a representative coastal property owner
a representative of the environmental community

Schedule and Benchmarks The CEAC will meet on as-needed basis to provide Ecology advice on the following kinds of concerns:

Consultant Selection

Requests for Qualifications (RFQs)
Requests for Proposals (RFPs)
Review of RFQs and RFPs and consultant selection

Study Plan Refinement

Study Task Scopes of Work

Work Products

Review of Preliminary Draft Reports
Review of Draft Reports

Ecology will provide quarterly reports on the activities of the CEAC to OCRM.

Approach The CEAC will be convened by the Department of Ecology and will be supported by Shorelands staff. Support will consist of all normal support for advisory committees: meeting notices, meeting minutes, an provision of meeting facilities.

Cost Estimate The cost of support for the CEAC is estimated to be 0.25 FTE per year for the three year duration of the Erosion Management Project, or approximately \$19,000 per year (see Table 2 for cost breakdown by object class).

Outyears Work Program

The Coastal Erosion Management Project is presented as a three year program. Summary descriptions of the tasks can be found in the Work Plan Schedule section beginning at page 6.

State Fiscal Year 1994

Task 5: Secondary Effects of Shoreline Hardening on Coastal Ecosystems and Biological Resources. Task 6: Management of Coastal Slope Failure. Task 7: Coastal Management by Drift Cells. Task 10: Coastal Erosion Advisory Committee.

State Fiscal Year 1995

Task 8: Programmatic Environmental Impact Statement. Task 9: Alternative Shoreline Master Program Model Elements. Task 10: Coastal Erosion Advisory Committee.

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Public Access Strategy

Public access to Washington's coastal marine and fresh waters is limited and existing acquisition and development programs are not keeping pace with population growth. Shorelands concluded in its Assessment that the key to public access improvement is acquisition. Public opinion supports this conclusion as evidenced by the comments by 309 Focus Group participants and responses to the "309 questionnaire" which is reviewed the November 1991 issue of *Coastal Currents*.

Problem Summary

Just as acquisition is the key to public access improvement, funding is the key to acquisition. Possibly the most desirable source of public access acquisition and development funding in Washington state is the Interagency Committee for Outdoor Recreation (IAC). For local governments to be eligible for IAC funding, they must first develop and adopt IAC-approved comprehensive park, recreation, and public access plans.

Proposed Program Changes

Local governments would develop and adopt comprehensive park, recreation, and public access plans. As appropriate, elements of these comprehensive plans could be incorporated into local Shoreline Master Programs as public access elements.

Program Change Rationale

Local governments are better suited to the acquisition and development of public access than is the state Coastal Zone Management Program. In fact, the state Coastal Zone Management Program has no established procedure for acquiring and holding property.

Work Plan Schedule

The anticipated funding requirements of the primary improvement objectives (wetlands, erosion management, and growth management) are sufficient to absorb any Section 309 funding which might be available to Washington state. Additionally, Shorelands requires sufficient lead time to acquaint local governments with the opportunities available under Section 309 as well as the special administrative requirements. Therefore, no public access projects are presently proposed.

Fiscal Year 1993 Work Program

No projects are proposed for State Fiscal Year 1993.

Outyears Work Program

To be announced.

Growth Management Strategy

General Information

Within the Puget Sound basin's 12,800 square mile land area, (19% of Washington's land area), there are twelve counties that directly abut the Sound's approximately 2,400 miles of coastal shoreline. There are also approximately 577,000 acres of wetlands within the coastal counties. By the turn of the century, the 3.2 million people (69% of the total state population) presently residing in these counties are expected to increase by 19% to 3.8 million. By the year 2010, total basin-wide population is expected to exceed 4.4 million (38% increase). Nearly 60% of the increase is expected to result from in-migration. While the three southwest coastal counties have not experienced the same rate of growth that has occurred to the north, they have experienced growth and development of a localized nature, particularly in shoreline areas. The rapid rate of growth anticipated for this region as a whole can be expected to result in substantially increased secondary and cumulative impacts to the coastal zone.

As detailed in the following pages, there exists in Washington State a close relationship between the Shoreline Management Act of 1971 (SMA) and more recently passed 1990 and 1991 Growth Management Act legislation (GMA). Both are state-wide planning and regulatory programs, with the SMA focusing more specifically on shoreline areas. Linkages exist in a number of areas, including:

- The GMA requires local governments to both designate and protect wetland areas. It also establishes "minimum guidelines" for classifying such resources, which specifically recommend local adoption of Ecology's Model Wetland Protection Ordinance. The SMA also has strong policy and regulatory ties to wetlands protection in shoreline areas.
- In 1991, the State Legislature directed the Department of Community Development (DCD) to prepare "procedural criteria" to assist counties and cities in adopting GMA required comprehensive plans and development regulations. Ecology is participating

directly with DCD in the preparation of these criteria, and will be incorporating shoreline growth and cumulative impact concerns, including wetlands, into the process.

- The GMA established a new category of “Natural Resources of State-wide Significance” in order to recognize resources that possess outstanding natural, ecological, or scenic value. High quality wetlands, and “Shorelines of State-wide Significance” (as defined in the SMA), will likely fall within this category of resources that warrant a higher level of resource protection.
- Section 90.58.340 of the SMA requires that local governments consider recommendations by Ecology to ensure that comprehensive plans and development regulations are consistent with the SMA, its guidelines, and any Shoreline Master Programs (SMPs) that are applicable to adjacent shorelines of the state (i.e. to ensure adjacent land consistency). Through this process, Ecology Shorelands Program can ensure consistency by recommending specific modifications to proposed local comprehensive plans and regulations (mandated by the GMA) and/or by recommending improvements to related local SMPs.
- Because existing SMPs adopted under the SMA incorporate both planning and permitting functions, there is also a very practical linkage between the GMA and the SMA. Local governments after completing GMA required updates to their comprehensive plans and implementing regulations (which may include SMPs and their use regulations), will likely find it difficult to continue administering outdated local SMPs. This will provide the impetus for substantial improvements to existing local SMPs.

Problem Summary

As indicated in our Section 309 Assessment, rapid growth in the coastal region is resulting in a wide range of cumulative and secondary impacts on our coastal resources from such things as drainage increases, sedimentation, non-point source pollution, and habitat encroachment. These impacts include the loss of wetland functions and values. Thus, consideration of growth related issues is fundamental to the state-wide planning efforts of both the SMA and the more recently enacted GMA (and to improvement of the state CZM program).

Basic research into the legal relationships between shoreline management and growth management in Washington state was completed in 1991 (see Trohimovich papers) by the Shorelands and Coastal Zone Management program. That research concluded that a more proactive effort at providing technical and financial assistance to local governments (who are now involved in implementing both planning functions) is necessary to assure local Shoreline Master Program amendments consistent with both GMA and SMA requirements. Improved coordination between state and local government shoreline regulators is needed to more effectively implement measures that will control the cumulative impacts of growth on shoreline and wetland resources. Interdisciplinary approaches and agreements between Federal, state, and tribal interests may also be necessary to coordinate and enhance efforts to control growth and its cumulative impacts.

Local governments do not typically possess the required expertise to address the complex issues of growth and shoreline cumulative impacts, hence, they depend upon Ecology for expertise and specific advice and guidance. The SMA in Section 90.58.050 addresses Ecology’s oversight role in stating that the department shall work with local government “primarily in a supportive and review capacity” to ensure local compliance with Act. Since local government in Washington

state has the “primary responsibility for initiating and administering” the regulatory aspects of shorelands management, Ecology has been required over the last twenty years (since passage of the SMA), to develop a close working relationship with local governments. This project will build upon and enhance the existing cooperative nature of this state-local relationship.

Consistent with the findings of our assessment, Ecology recognizes with regard to wetlands, that a State Wetlands Conservation Plan is needed that will provide for improved coordination between all federal, state and local agencies involved in wetlands protection and integrate all wetland protection programs that exist or are being developed. (This includes all local comprehensive plan policies and regulations for wetlands protection that are required by the GMA.) The state plan could also ultimately be adopted as a component of the state CZMA Program. However, because the GMA does not include state standards, the challenge facing Shorelands will be to encourage local governments to adopt and implement comprehensive plan policies and regulations that utilize both regulatory and non-regulatory components to achieve and track no-net-loss of wetlands.

Proposed Program Changes

The primary focus of this project will be to integrate CZMA/SMA program improvement priorities, including those pertaining to wetlands protection, into the new local comprehensive plans and implementing regulations (including local Shoreline Master Programs) that are required to be developed by the GMA. There are presently one hundred and fifteen (115) local shoreline master programs in the coastal zone that could potentially be amended and improved to specifically address the cumulative impacts of growth on coastal shoreline and wetland resources. Each of these programs, as required by the state Shoreline Management Act are adopted as state rule (Washington Administrative Code). These programs collectively make up the planning and regulatory aspects of Washington State’s approved Coastal Zone Management Program.

In addition, by incorporating the CZMA/SMA program improvement priorities into local comprehensive plans and implementing regulations, the state will be enhancing adjacent lands consistency within the coastal zone as required by the SMA. Such adjacent lands consistency is also regarded as a CZMA program improvement.

With regard to wetlands, Ecology’s Shorelands Program intends to work with coastal local governments to assist them in preparing and implementing comprehensive plans and regulations that are consistent with a State Wetlands Conservation Plan now being developed utilizing Environmental Protection Agency funds. The state will provide local governments with technical assistance in applying existing and proposed wetlands guidance in the process of developing and adopting their GMA required comprehensive plans and implementing regulations (which will typically lead to local SMP improvements).

Completion of this project would enable local governments to better balance the impacts of growth while at the same time properly manage their coastal resources in a manner consistent with the CZMA/SMA through development and adoption of local Shoreline Master Program amendments and other regulatory measures. Without active interaction of Ecology’s Shorelands Program with local government during the GMA induced state-wide planning initiative, shoreline policies and cumulative impact concerns will likely not receive the attention they deserve. Local government planners, if provided with needed technical assistance and model policies and regulations will be better equipped to incorporate CZMA/SMA-consistent revisions

into their comprehensive plans and local implementing SMPs. In addition, as a result of our efforts it is anticipated that there will be a significant reduction in the loss of wetland functions and acreage.

Program Change Rationale

In light of recent GMA requirements for local governments to update local comprehensive plans and implementing regulations there now exists, a unique opportunity to incorporate these improvements into local Shoreline Master Programs and related regulations. To do this however, direct technical and financial assistance to local governments is needed. Where this assistance is provided, local governments will get a head start in developing compatible growth, wetlands, and shoreline management strategies in a manner that reduces the potential for conflict in the future. The results of such an endeavor would logically include improvement of existing shoreline master programs consistent with SMA and CZMA policy.

The Shorelands and Coastal Zone Management Program, which currently provides state oversight over local permit review and SMP amendment processing and policy development is well suited to addressing this issue because of its continued close working relationship with those involved with growth management implementation at the local level.

Work Plan Schedule

The overall work plan schedule and scope of activities for this project will build upon recent FY92 assessments conducted by the Shorelands Program suggesting appropriate delivery strategies for growth management related services offered to local government. This assessment, previously conducted in FY 92 with Section 309 CZM funds, will help identify state resource agencies and programs within Ecology itself that have shorelines and growth management expertise that could be of assistance to local governments in their growth and shorelines management related efforts. The assessment will also assist in fine-tuning the final delivery strategy employed by this project.

Cost Estimate Summary

Project costs are estimated to be \$221,000 for this first year (see Federal Budget forms) of the four year effort. Project funding will be divided amongst the following:

1. Technical assistance provided by a total of three (2.8) Shorelands Program FTEs, consisting of:
 - Environmental Planner 3, with responsibilities for policy development, project marketing, and technical assistance to local government;
 - Environmentalist 3 or Environmental Planner 2, with responsibilities for wetlands policy planning and growth management related technical assistance to local government; and
 - Environmentalist 2, (at 0.8 FTE) with responsibilities for grants management and support of technical assistance services.
2. An additional \$150,000 annually is proposed to be used for related financial assistance grants to local governments derived from Section 306 CZM funds. This will provide financial assistance to between 10 and 15 local governments annually beginning in FY '93.

Success Assessment

The likelihood of attaining the proposed program changes is high, especially due to new state GMA mandates which require local governments throughout the state to fully update their comprehensive plans (RCW 36.70A.040) and adopt consistent implementing regulations (RCW 36.70A.120), all of which closely relate to existing local Shoreline Master Programs (SMPs). As a result of the GMA, Washington State now faces its first mandatory state-wide planning effort, and most jurisdictions have indicated their willingness to comply by adopting interim regulations for their critical areas, including wetlands, by March 1, 1992, as required.

Shoreline Master Programs (required by RCW 90.58) possess both planning and permitting authority to manage shoreline development within these same local jurisdictions that now are required to plan and manage growth and its cumulative impacts. If inconsistencies arise between local growth and shoreline management plans and regulations, a direct conflict between local development standards and state mandated shoreline permitting requirements could result.

Local governments are thus obliged to consider shoreline policy in the planning process and update their local SMPs accordingly. The SMP provides a direct linkage between local planning policy and the implementation of that policy in shoreline areas. It follows then, that local governments need to enhance their SMPs to provide an effective tool in implementing local shoreline cumulative and secondary impact controls.

Anticipated Support Acknowledging this need and taking action to address the need are two related but different issues. The Section 309 Assessment documents that growth and cumulative impact related issues (including wetlands protection) are foremost on local governments' minds at the present time and that there is considerable need for better guidance and direction at the local level on integrating coastal and shoreline management concerns into required growth management policies and regulatory updates.

Local governments do not typically possess the required expertise to address the complex issues of growth and shoreline cumulative impacts, hence, they depend upon Ecology and other state resource agencies for expertise and specific advice and guidance. The SMA in Section 90.58.050 addresses Ecology's oversight role in stating that the department shall work with local government "primarily in a supportive and review capacity" to ensure local compliance with Act. Since local government in Washington state has the "primary responsibility for initiating and administering" the regulatory aspects of shorelands management, Ecology has been required over the last twenty years (since passage of the SMA), to develop a close working relationship with local governments. This proposal will build upon and enhance the existing cooperative nature of this state-local relationship.

The recently adopted GMA also depends upon a joint local/state partnership to implement a state-wide planning effort.

Ecology recognizes that certain steps must be taken by local government before they are prepared to draft SMP amendments addressing growth and related shoreline cumulative impacts. Although the sequencing of local government activities will vary from jurisdiction to jurisdiction, the process typically begins with the development of local comprehensive plan policy, which then leads to adoption of local development regulations (both of which are mandated by the GMA, in this order). Amendment of SMPs will result as local governments address the regulations that implement their comprehensive plans. For this reason, the first year activities of this proposal

focus on assisting local governments in the preparation and adoption of model comprehensive plan policies related to the cumulative and secondary impacts of growth.

Proposed State Action The Department of Ecology Shorelands and Coastal Zone Management Program will provide overall project management and will coordinate with other state resource agencies with expertise to provide anticipated growth and cumulative impact related services directly to local governments.

Fiscal Year 1993 Work Program

Ecology recognizes that certain steps must be taken by local government before they are prepared to draft SMP amendments addressing growth and related shoreline cumulative impacts. Although the sequencing of local government activities will vary from jurisdiction to jurisdiction, the process typically begins with the development of local comprehensive plan policy, which then leads to adoption of local development regulations (both of which are mandated by the GMA, in this order). Amendment of SMPs will result as local governments address the regulations that implement their comprehensive plans. For this reason, the first year activities (State Fiscal Year 1993) of this project focus on assisting local governments in the preparation and adoption of growth related model comprehensive plan policies, a necessary prerequisite to subsequent SMP amendments (i.e. CZM program improvements). Project activities include:

1. Development of project technical assistance materials including preparation of model shoreline policies (and regulations where timely) for incorporation into local Comprehensive Plans required by the GMA.
2. Conducting interagency and intra-agency coordination within Ecology and with the state Department of Community Development Growth Management Division to ensure consistent schedules, outreach methodology, and avoidance of conflict in policy and approach.
3. Revising current Section 306 CZM grant award criteria to favor proposals addressing growth and cumulative impact issues, before the next round of local government grant solicitations.
4. Soliciting and delivering technical and financial assistance to local governments (focusing on coastal impact concerns in local growth management planning and policy development, including wetlands protection).
5. Conducting State Environmental Policy Act (SEPA) review and comment to local government on proposed comprehensive plan policies and development regulations.

Expected Products

1. Preparation of model shoreline policies addressing coastal cumulative and secondary impact issues, designed for incorporation into local Comprehensive Plans required by the GMA.
2. Delivery of technical assistance to roughly 40 local governments in the coastal zone, with the objective of integrating coastal cumulative impact concerns related to growth into locally approved comprehensive plans.
3. Coordination within Ecology and with the state Department of Community Development Growth Management Division to ensure consistent policy and approach to addressing coastal cumulative impact issues.

4. Grants management for current state FY '93 CZM Section 306 local government grants involving local comprehensive plan policy issues or SMP amendments related to coastal impacts and growth management.

5. Review and provide comment to roughly 50 local governments on coastal cumulative impact issues addressed in draft planning documents submitted in accordance with SEPA policy and procedures.

Outyears Work Program

Fiscal Year 1994

Continue provision of technical and financial assistance to coastal local governments. Technical assistance will be provided to 40 coastal jurisdictions annually. In FY '94 the project will continue to work with local governments to ensure local adoption of growth management policies that incorporate model policy provisions developed in task 1 above. New project efforts at this time will include preparation of "model" shoreline management and wetland regulations, designed to implement the policy provisions developed in task 1 above. By FY '94 certain jurisdictions may be far enough along in the local process to begin addressing local implementing regulations and shoreline master programs. In this case, technical assistance will be focused on appropriate implementing strategies and regulations that result in program improvements. Provision of financial assistance to local governments will begin in FY '94 and continue through the duration of the program. No contractual costs are anticipated.

Fiscal Year 1995

This years activities will continue to deliver technical assistance to approximately 40 local coastal jurisdictions similar to previous years, but will fully shift project emphasis from that of establishing fundamental policy to that of developing consistent implementing regulations adopted as program improvements. By July 1, 1994 local governments planning under the GMA must enact development regulations that are consistent with and implement their newly adopted comprehensive plans. FY '95 efforts work in harmony with these mandates by providing financial and technical assistance to local governments specifically for development of local implementing regulations (including updated SMPs) that effectively address coastal growth impact issues consistent with the CZMA/SMA policy. Grants management and monitoring will occur for between 10 and 15 local governments receiving Section 306 CZM financial assistance. No contractual costs are anticipated.

Fiscal Year 1996

This years activities will conclude the provision of technical and financial assistance to local governments and shift focus to concentrate on Department of Ecology formal review and adoption of CZM Program improvements (i.e. enhanced local Shoreline Master Programs) consistent with state SMA and CZMA policy. Shorelands will be responsible for final rule adoption of local SMP amendments (in accordance with SMA and Washington Administrative Code requirements). No contractual costs are anticipated.

Special Area Management Planning Strategy

General Information

Numerous river basins, estuarine embayments, and other landscape features of Washington state are governed by a multitude of local, state, regional, Tribal, and federal governments and agencies which must address a variety of intertwined resource management issues.

Problem Summary

The Final Assessment identifies a number of landscape features which might benefit from special area management planning. Key to an area being eligible for special area management planning designation and funding is a desire and commitment on the part of all affected agencies to participate in both planning and plan implementation. No proposal for special area planning will be accepted without evidence of that desire and commitment.

The types of areas identified in the Final Assessment as exemplifying landscapes which might benefit from special area management planning include:

Willapa Bay	Skagit River Basin
Nooksak River Basin	Chehalis River Basin
Hood Canal	Puget Sound Urban Bays
North Puget Sound Oil Trans-shipment and Pipeline Region	

None of these areas can yet be considered active candidates for special area management planning because clear evidence of the desire and commitment to proceed is not in evidence. However, serious discussions have been occurring with representatives of agencies and organizations with interests in the Chehalis, Nooksak, and Puyallup river basins.

Proposed Program Changes

In the long term, the proposed program change(s) would be some form of a memorandum of agreement (MOA) between the participating agencies and organizations for the implementation of the completed special area management plan.

Description Until a specific area for special management planning is nominated by the participating agencies and organizations no specifics regarding potential program changes can be offered.

Anticipated Effect The anticipated effect would be the coordinated implementation of the completed special area management plan.

Program Change Rationale

No realistic alternatives can be identified.

Work Plan Schedule

The first step to enabling participating agencies and organizations to make informed choices as to preferred approaches to carrying out a special area management planning process is to gain the knowledge as to the relative advantages and disadvantages of the alternative approaches available. To that end, the first step proposed is a case study of special area management planning processes completed or underway in Washington state. This task will be carried out as a Section 306 Grant Task.

Cost Estimate Summary

The minimal annual cost of providing staff support (at 2.0 FTE) to a SAMP advisory committee is approximately \$200,000; the costs of technical research and planning activities are additional and would depend on the needs of any particular SAMP program. This cost estimate is based on practical experience gained in carrying out the Nisqually River Management Program.

Success Assessment

To enhance the likelihood of the successful initiation and completion of specific SAMP programs, the first task (to be carried out as a Section 306 Grant Task) will be the completion of a case study of existing SAMP and SAMP-like programs in Washington state to serve as an education and awareness tool for prospective participants.

Anticipated Support Documentation of support for specific SAMP projects will be provided at the time of application.

Proposed State Action Documentation of support for specific SAMP projects will be provided at the time of application.

Fiscal Year 1993 Work Program

No projects are proposed for State Fiscal Year 1993.

Outyears Work Program

As noted above, no specific area for special management planning has been nominated by the participating agencies and organizations, thus no specific planning studies are identified.

Shorelands reserves the right to amend this strategy at such time as commitment is demonstrated for participation in a SAMP process.

5 • Fiscal And Technical Needs

Fiscal Needs

In summary, Washington's Shorelands and Coastal Zone Management Program, along with other state agencies, is presently subjected to severe budget problems with no likelihood of relief in the near future. Washington's budget problems are caused by the national recession. Typically, national recessions spread to the Pacific Northwest after they have peaked on the East Coast, and linger in the Northwest after recovery has begun elsewhere.

Washington State Budget

Washington State is currently experiencing a tax revenue shortfall of over \$500 million, and a resultant budget deficit that will exceed \$900 million. The expectation is that the next quarterly tax revenue estimate will place the shortfall at over \$1,000 million (\$1 billion). The 1992 State Legislature has proposed a combination of budget reductions (\$540 million) and tax revenue increases that would address the projected deficit. The state's natural resource agencies, including the Department of Ecology, would be subjected to significant cuts in funding from state sources.

Department of Ecology Budget

The budgets recommended by the Governor and approved by the 1991 Legislature for the Department of Ecology included a significant increase over the 1989-91 biennial budget. However, much of this increase was earmarked to provide funding for new initiatives required by new state legislation, such as the greatly expanded air pollution control effort. Most existing programs experienced some reduction in state funding, at least in relative terms, if not in actual dollars. For example, the agency was directed to absorb additional costs over the previous biennium for merit pay increments and inflation factors.

Given the foregoing, it is unrealistic to expect any budget increase, and would be politically unacceptable for the Department to request one given the present economic climate. In fact, allotments were reduced for contracts and travel during the first quarter of fiscal year 1992 and additional reductions in conjunction with a mandated 2.5% across the board cut became effective in January 1992 with further cuts planned.

Shorelands and Coastal Zone Management Program Budget

Shorelands received an increase of two million dollars to support the Governor's Executive Order for the Protection of Wetlands for the 1991-93 biennium. However, over \$600,000 of this total was earmarked for pass through to three other state agencies - the Departments of Agriculture, Fisheries, and Wildlife. This initial funding was received from the Governor's Supplemental Budget. Legislative support for this effort was never strong, and seems to be eroding further in the 1992 Legislature.

Overall, the Program experienced a reduction of approximately \$900,000 from the previous biennium. Nearly \$500,000 of this total was related to the agency cuts stemming from the lack of appropriation increases for inflation, merit pay hikes, and certain equipment purchases. The Program also surrendered two FTEs in a budget reduction exercise in fiscal year 1991. The

remaining \$400,000 in reductions was associated with cuts in contracts and travel as directed by the Legislature, and increases in required program support for agency level administration.

Since the Shorelands Program is more heavily dependent on state general funds than other programs in Ecology, the mandated 2.5% reductions were magnified for Shorelands to adjust for the inability to capture sufficient reductions in other programs with dedicated funds. The bulk of these reductions will be achieved through maintaining vacancies for present and future unfilled positions, including some established by the Puget Sound Water Quality Plan for the protection of shellfish and the restoration of wetlands.

The impacts of these measures will require the Program to narrow its range of activities, reduce contractual obligations, and limit expenditures for equipment and travel. It will also diminish the amount of grant funds available to local governments. However, the maintenance of necessary state funds to match the federal CZM grant will remain a high priority, although the reduction in the level of federal support from 80% to 50% has proven to be a continuing difficulty.

Finally, it should be noted that Shorelands lacks the authority to secure off-budget funding from sources such as user fees.

Technical Needs

The major focus of our technical needs will be enhancements to our geographic information system (GIS) capabilities. Only minor equipment and software needs are anticipated for our existing work station for the near term. However, additional staffing and, perhaps some equipment, may be needed for data collection, monitoring, and digitizing. The Program will continue to support the collection of stream flow data and the completion of wetland inventories. In the future there is significant interest in establishing coastal monitoring stations for the collection of wind, wave, and current data, in establishing monitoring stations for collecting data on coastal erosion, and the investigation and delineation of coastal high hazard areas.

6 • Incorporations By Reference

The following laws, regulations, policies, assessments, and studies are incorporated by reference into this assessment and strategy. Copies of certain references are available on request; please use the mail order form bound into this report. Other references may be found in federal or state depository libraries.

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Appendix A: Section 309 Questionnaire Summary Report

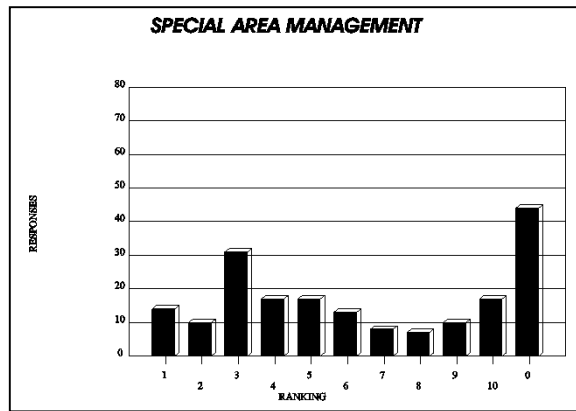
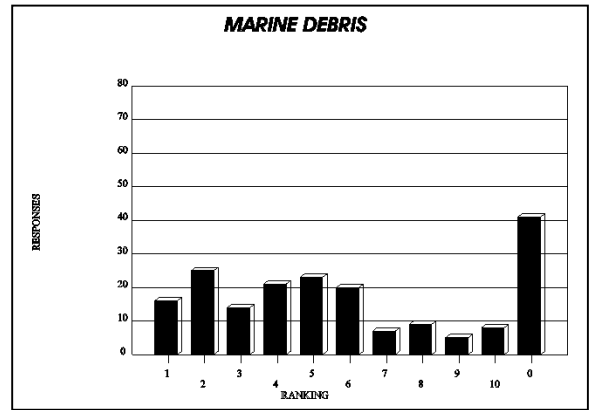
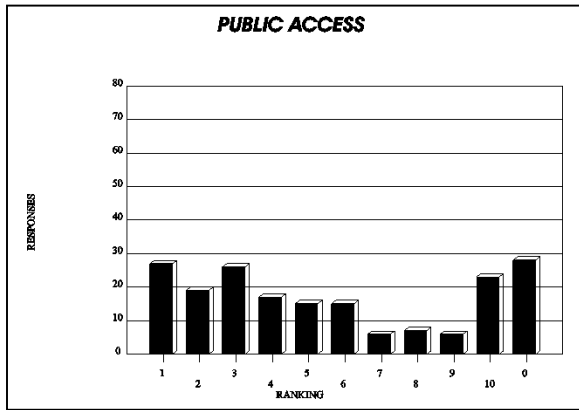
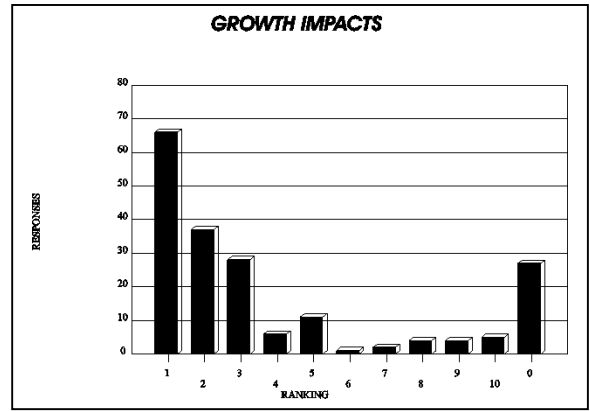
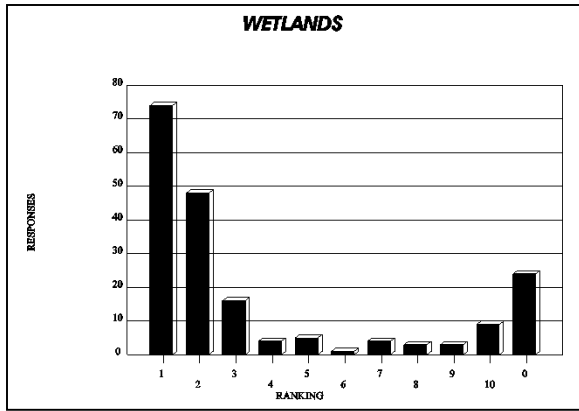
The November issue of Shorelands' newsletter, *Coastal Currents*, carried a four page - 29 question public opinion questionnaire. Nearly 200 questionnaires were returned from a circulation of approximately 4,000. No comments on the assessment were received. Responses to the questionnaire have been entered into a data manager and limited preliminary analyses have been retrieved. A complete report on the results of the questionnaire will be published in the March or April edition of *Coastal Currents*.

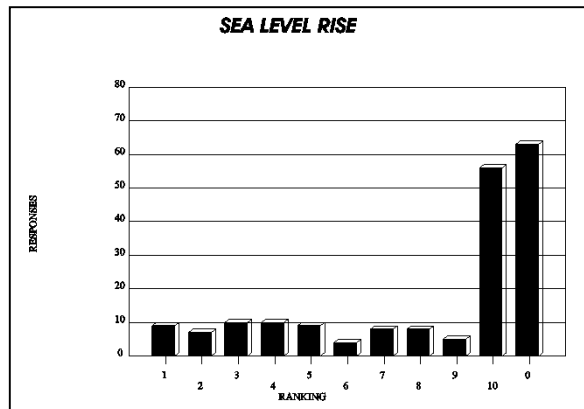
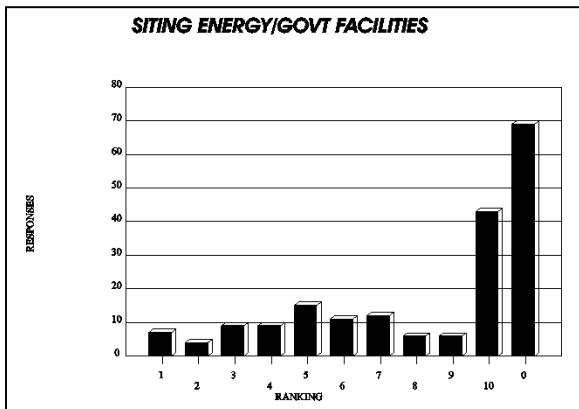
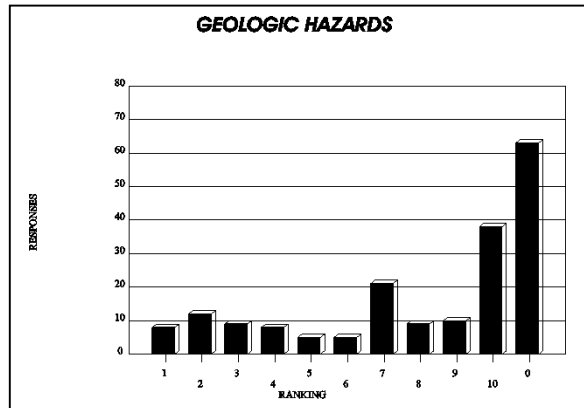
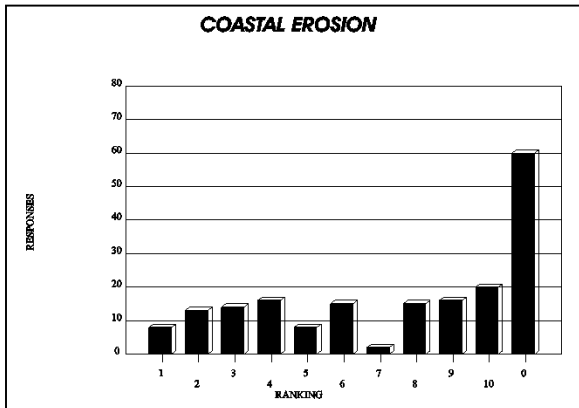
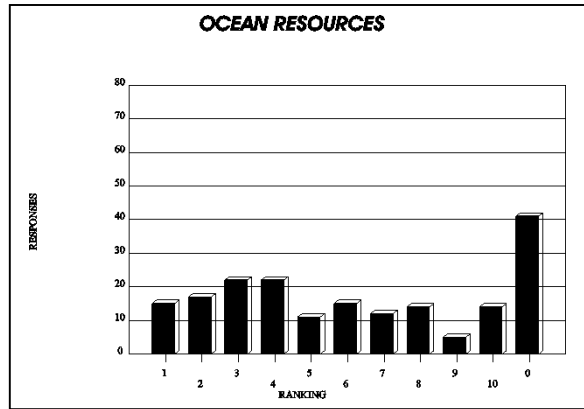
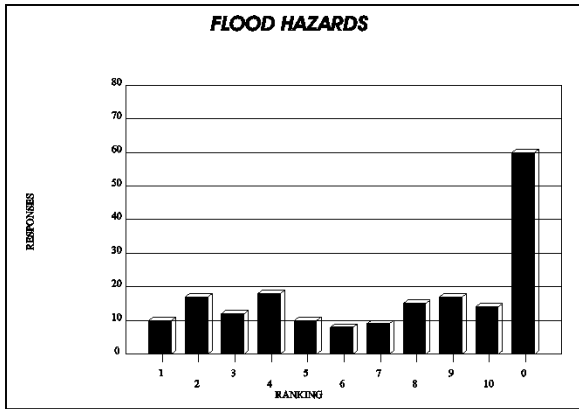
Question 29 asked: Shorelands is developing near term goals to pursue over the next 3 to 5 years as a part of a federal coastal management strategy. Please rank the following program improvement goals specified by Congress.

- | | | |
|--|--|---|
| <input type="checkbox"/> Wetlands | <input type="checkbox"/> Flood hazards | <input type="checkbox"/> Geologic hazards |
| <input type="checkbox"/> Sea level rise | <input type="checkbox"/> Public access | <input type="checkbox"/> Marine debris |
| <input type="checkbox"/> Growth impacts | <input type="checkbox"/> Special area management | <input type="checkbox"/> Ocean resources |
| <input type="checkbox"/> Facilities siting | <input type="checkbox"/> Coastal erosion | <input type="checkbox"/> Coastal rivers erosion |

The public response indicates that these issues can be grouped into four levels of concern: high , mid range high, mid range low, and low. Based on the questionnaire, high priority issues are wetlands and the cumulative and secondary effects of growth; mid range high priorities are public access, marine debris, and special area management plans; mid range low priorities are flood hazards, ocean resources, and coastal erosion (including coastal rivers erosion); low priorities are sea level rise, geologic hazards, and facilities siting.

The responses to the question are displayed graphically on the following pages. The graphs indicate the number of persons ranking each issue as 1st, 2nd, 3rd, etc. most important, through rank 10 (least important). Rank "0" on the graph indicates the number of persons not ranking that issue at all.





Appendix B: Section 309 Assessment Focus Groups Summary Report

The Shorelands and Coastal Zone Management Program is engaged in a review and evaluation of Washington's coastal zone management program. The 1990 amendments to the federal Coastal Zone Management Act included a new Section 309 grants program in which Congress established eight "improvement objectives" for state coastal zone programs:

- wetlands protection;
- coastal hazards management;
- provision of public access;
- marine debris control;
- limiting the cumulative and secondary effects of growth upon coastal resources;
- special area management plans;
- ocean resources management; and
- siting of energy and government facilities.

As part of the required public involvement program, Shorelands hosted four focus groups in western Washington. Focus group meetings were held in Mount Vernon, Seattle, South Bend, and Olympia on December 9, 10, 11, and 12. Fifty eight persons representing local government, business and industry, Tribal governments, academia, and the environmental community were invited; 29 persons were either able to participate or delegated a representative. The state's Coastal Zone Management Program applies to only the 15 coastal counties, therefore focus group meetings were held only in western Washington.

The purpose of the focus groups was first to provide Shorelands with a check the accuracy of our Draft Section 309 Assessment; was anything overlooked and were Shorelands' perceptions accurate? Second, what should be Washington's priorities among the eight improvement objectives? Third, what should be included in a list of potential strategies for addressing priority improvement areas?

The following summarization simply reports on the comments and recommendations of the focus groups. The following comments do not reflect public policy nor should they be regarded as a scientific or statistically representative sampling of public opinion. No decision has been made yet on the identification of priorities for improvement of its Coastal Zone Management Program, nor have any specific strategies been identified.

Mount Vernon

Participation in the Mount Vernon focus group was by two local government shoreline administrators, two Western Washington University professors of coastal science and planning, two environmental advocates, and one representative of the business community. One representative of local government who was unable to attend submitted written comments which have been incorporated into this summary.

Of the eight Section 309 “improvement objectives” the Mount Vernon group identified “cumulative and secondary effects of growth” as the key issue under which all other important issues (wetlands, coastal hazards, and public access) could be subsumed. Marine debris was identified as being of secondary importance. Special area management planning was viewed with some suspicion as being bureaucratic. The remaining objectives (ocean resources and facilities siting) received no discussion.

Specific problems identified included:

Wetlands: loss remains a problem; a local/state perspective should be maintained, as compared with a federal perspective. (This latter comment was in reaction to the proposed Bush Administration wetlands regulatory definition which reportedly would substantially diminish the extent and nature of wetlands eligible for protection under Section 404 of the Clean Water Act.)

Coastal Hazards: some popular solutions become part of the problem, e.g. the adverse cumulative effects of large scale bulkheading upon physical shoreline processes and biological resources.

Public Access: there is a need to recognize the impacts of providing access; there is an inadequate identification of open road ends which could be used for public access; signage in general is inadequate; a better database on existing availability is needed.

Cumulative Effects of Growth: unregulated land clearing practices; the adverse cumulative effects of bulkheading; the adverse cumulative effects of onsite sewage disposal upon ground water quality and estuarine water quality. The assessment should presume that Growth Management Act activities will result in protection of critical areas and natural resources.

Specific action ideas and philosophical approaches identified were:

- Fund local government to develop model Shoreline Master Program elements and Growth Management Act critical area guidelines and regulations.
 - Involve the private sector in planning through membership on advisory committees.
 - Identify specific geographic areas and issues requiring attention; do use a broad brush approach. Initially look at wetlands, coastal hazards, public access, and beaches and tidelands.
- Any programs which would work towards getting the Shoreline Management Act and the Growth Management Act in synchronization.
- Storm water runoff should be addressed because of its multiple and cumulative effects including erosion, flooding, and water quality degradation.
- Develop memoranda of understanding (MOUs) between agencies with similar responsibilities for increased organizational effectiveness as well as better implementation of existing laws and regulations.
- Enforcement is a problem due largely to a lack of staff (and funding) plus political interference. The sentiment was there to use “carrots” instead of “sticks” but no examples of “carrots” were provided.
- Don’t encourage growth, and manage the growth that’s inevitable.
- Develop a mitigation banking system (particularly for wetlands) through private and public action.

- Any wetlands or coastal hazards strategies should be built upon Growth Management Act mandates.
- The Trans Mountain pipeline corridor should be considered as a candidate for special area management planning.

Seattle

Participation in the Seattle focus group was by two local government shoreline administrators and four environmental advocates. Invited representatives of business and industry were unable to attend.

Of the eight improvement objectives, four were viewed as an integrated “package:” wetlands, coastal hazards, cumulative and secondary effects of growth, and special area management planning. The other issues received little or no discussion, although the need for acquisition of public access sites was acknowledged.

Specific problems identified included:

Wetlands: failure to achieve passage of the Wetlands Management Act.

Coastal Hazards: improper development and construction in flood hazard zones and the inadequacy of existing technical studies and development standards and regulations; the inadequacy of geotechnical study standards (except with local governments which can afford to keep a geologist on staff); the assessment fails to identify logging practices and policies in the upper watersheds as a contributing factor to flooding in the lower river valleys.

Special Area Plans: Hood Canal was cited as being a potential candidate for special area planning; a generic problem is getting money to initiate programs.

Specific action ideas and philosophical approaches identified were:

- Provide technical and policy assistance to local governments in addressing the regulatory and critical areas aspects of the Growth Management Act, particularly with respect to wetlands.
- Work through the Growth Management Act as much as possible where ever there are common issues with the state’s Coastal Zone Management Program.
- Use the watershed planning process (Centennial Clean Water Act) as a model for future regional resource management planning projects.
- Work with the Growth Management Act and the Growth Management Clearing House at the University of Washington to address measurable standards.
- Incorporate relevant portions of the Growth Management act into the state’s Coastal Zone Management Program.
- Develop model guidelines, ordinances, and Shoreline Master Program elements.
- Address wetlands protection through the Growth Management Act critical areas process.
- Make more use of the 401 water quality certification denial for protection of wetlands.
- Develop guidance for conducting cumulative impacts analyses in environmental impact statements.

- Support the extension of the Coastal Barrier Resources Act to Washington state, and develop a similar state level program to deny state subsidies (e.g. highways, sewerage, etc.) for development of identified coastal barriers.
- Establish a program and policy to review local comprehensive plans in comparison with the local governments' Shoreline Master Program; if the comprehensive plan is less rigorous than the SMP, rejection of the comprehensive plan should be recommended.

South Bend

Participation in the South Bend focus group was by two representatives of regional planning agencies, four representatives of local governments, and two representatives of the business community. One other representative of the business community was unable to attend, but did submit written comments which are incorporated into this summary.

Of the eight improvement objectives, the group focused on two: the cumulative and secondary effects of growth, and special area management planning. The other objectives were not discussed in any depth.

In fact, the discussion revolved mostly around an issue not eligible for Section 309 funding: the need for more money for enforcement and staffing to carry out existing programs. Many of the identified problems were generic and could not be lumped under one of the eight improvement objectives.

Specific problems identified included:

- The special character of southwest Washington compared to the Puget Sound region is not recognized by the state nor is it taken into account in state programs. While the state needs to take a stronger position on policy and state programs, there is also a need to sensitize those policies and programs to local and regional conditions.
- There are already sufficient regulations as a result of the Shoreline Management Act, Growth Management Act, federal Clean Water Act, and the Grays Harbor Estuary Management Plan to name a few; no additional laws are needed.
- Public participation in the planning and land use decision making process is inadequate in this part of the state.
- Pinipeds (Harbor Seals and California Sea Lions) have in the past been documented to have increasing populations, to be destructive of gill nets, and to be responsible for up to 1/3 of the loss the normal catch of the commercial salmon industry.

Funding: there is inadequate funding for staffing and enforcement of existing programs at present; Section 309 program improvements could make a bad situation even worse.

Enforcement: there is an inadequate state presence in the region coupled with inadequate support for local government decisions and enforcement actions; enforcement in general is inadequate. Additionally, there seems to be such a high turnover rate in state enforcement positions that there is a need to constantly re-educate the new staff.

Coastal Hazards: flooding problems along the coast often result from soil saturation and high water tables as much as anything; this in turn also causes water quality problems when septic

system drain fields flood. The erosion at Washaway Beach is threatening the Blue Pacific Shores development.

Cumulative Effects of Growth: the single family and forestry exemptions and special treatments under the Shoreline Management Act are the source of many coastal management problems.

Specific action ideas identified were:

- Fund local governments to amend their Shoreline Master Program, specifically in the area of wetlands management. (This was in the context of both general improvements and larger scale planning based on requirements of the Growth Management Act.
- Develop best management practices (BMPs), particularly for agriculture and dairy farming for protection of water quality in general and the shell fish industry in particular.
- Develop model Shoreline Master Program elements and provide alternatives.
- As a special area management plan project, fund a coastal ocean agency. This was discussed in the context of the existing coastal counties' coordination program needing to be more comprehensive, more permanent.
- Carry out a feasibility study on the protection of shellfish and fin fish stocks from predation by Pinipeds.

Olympia

Participation in the Olympia focus group was by two local government shoreline administrators, two state agencies (other than Ecology) involved in coastal planning, one public ports representative, and one environmental advocate. One other representative of a state resource agency was unable to attend, but did submit written comments which are incorporated into this summary. One local government attendee provided written amplification of their discussion points; this too was incorporated into this summary.

Of the eight improvement objectives, the Olympia group also identified the cumulative and secondary effects of growth as the key issue which also involves wetlands, coastal hazards, and public access. Coastal hazards in its own right also received emphasis. The vehicle for carrying out solutions in many respects was seen to be the special area management plan. Inadequate funding for carrying out existing programs was acknowledged to be a major problem for both state agencies and local governments.

Specific problems identified included:

Public Access: improvements in public access are an acquisition and development funding problem, not a regulatory issue.

Coastal Hazards: flooding, both of the coastal zone and on the lower reaches of rivers is an increasing problem due to largely land use practices and land use changes; erosion management practices and policies which allow virtually unrestricted bulkheading and the resultant adverse cumulative effects are a major problem. Part of the erosion/landslide management problem is that the easily developed sites were used up years ago and people are now moving onto development of the more difficult, more dangerous sites. A more thorough understanding of the cumulative effects of large scale shoreline hardening is needed.

Cumulative Effects of Growth: the siting of outfalls (sewage, industrial, and storm water) have had severe adverse effects on shellfish beds, including geoduck beds. There is also an incompatibility between marinas and eelgrass beds; in the past development permits have had to be denied to proposed marinas due to a proximity to eelgrass beds. Local governments are in need of technical and policy assistance in carrying out the mandates of the Growth Management Act.

Special Area Management Plans: the Shoreline Management Act and the Coastal Zone Management Act have fostered planning for uplands areas, e.g. local Shoreline Master Programs and the Grays Harbor Estuary Management Plan, but little attention has been paid to beach, nearshore, or deepwater habitats.

Marine debris: the assessment does not acknowledge the recent positive effects of MARPOL, the marine pollution control treaty, in controlling the disposal of solid waste and other forms of marine debris at sea.

Specific action ideas and philosophical approaches identified were:

- Flood management should be addressed on a comprehensive river basin basis.
- Reduce the amount of state overhead skimmed off the top of pass through grant funds to local government. Ecology takes 60%.
- Consolidate similar programs for cost efficiencies.
- When addressing public access, remember that 90% of the public access demand is on only 30 days of the year.
- Expand the Department of Natural Resources' definition of "navigable" for purposes of distributing Aquatic Lands Enhancement Account (ALEA) funds to local government.
- Use 309 funds as pass through grants to local government for development of the comprehensive park and recreation plans required by IAC to better enable local governments to acquire the funds necessary to acquire public access.
- Promote partnerships between local park and recreation agencies and port districts for provision of public access.
- There should be a cooperative program between the Department of Natural Resources and Ecology to identify sites that are appropriate for outfalls so that withdrawal of shellfish beds from certification or the potential for decertification will not occur.
- There should be a cooperative program between the Department of Natural Resources and Ecology to identify and characterize eelgrass beds (and possibly other sensitive marine macrophytes) and to identify zones of influence where it should be impermissible to locate certain facilities such as marinas.
- Ecology, in cooperation with other agencies, should develop a set of guidelines on how to address SEPA cumulative impacts.
- Provide technical and policy assistance to local governments in addressing the regulatory and critical areas aspects of the Growth Management Act, particularly with respect to wetlands, critical areas, natural resources of state-wide significance, and the development of procedural criteria.
- Special area management planning should or could be used to address:

- better definition of Shorelines of Statewide Significance for specific regions;
- initiation of local cooperative planning and management programs;
- the forestry-flooding issue on a river basin wide scale involving all the affected and involved jurisdictions, plus the timber industry, and involving the following elements:
 - use the TFW process and participants as a starting point and means of getting a reality check;
 - create a link between Centennial Clean Water Act funding and watershed planning and flooding. Fir Island was noted as an example of water quality problems caused or aggravated by flooding;
 - address “frequently flooded areas” under the Growth Management Act;
 - generalized land use and land change, not just timber lands.
 - the need for regional resource identification and mapping;
 - the need for better public education on regional resource issues;
 - growth management planning for identification of areas suitable and unsuitable for shoreline development to protect critical shoreline resources and areas. Some specific locales and issues include outfall siting *vis a vis* shellfish beds in South Puget Sound and Central Puget Sound; urbanization and industrial development *vis a vis* fish bearing rivers and streams at Bellingham Bay, Commencement Bay, Port Gardner, Elliott Bay, and Budd Inlet.
 - The cumulative effects of bulkheading should be addressed, and could be addressed either as a “coastal hazards” issue (e.g. erosion management) or as a “special area management plan” issue (e.g. a regional SAMP involving the three South Sound counties. (Note: Mason, Thurston, and Pierce counties have requested that the Department of Ecology prepare a programmatic EIS on the cumulative effects of bulkheading to enable local government planners, administrators, and elected officials to make better informed decisions regarding shoreline erosion management and regulation.
- Shorelands should prepare model Shoreline Master Program elements for (1) bluff setbacks, (2) bluff stabilization, and (3) shoreline erosion management for consideration and adoption by local government.